RAILROAD GAZETTE

FRIDAY, JANUARY 13.

NEWS OF THE WEEK.

We give below, in a condensed form, the leading news tems of the week. These items will be found in detail in their appropriate columns.

Elections.—Chicago & West Michigan, J. J. McVean Chief Engineer.—Denison & Washita Valley, John Scullin President.—Indianapolis, Decatur & Western, H. B. Hammond President.—Ohio & Northwestern, George West President.—Paris & Great Northern, J. O. Day President.—Pittsburgh, McKeesport & Youghiogheny, D. Hostetter President.—Verdigris Valley, Independence & Western, George J. Gould President.—Wheeling, Pittsburgh & Baltimore, J. B. Washington President.

Changes and Extensions.—*California:* Santa Ana, Fairview & Pacific completes survey.—*Georgia:* Atlantic & Blue Ridge will begin work in April.—*Kansas:* Lawrence, Atchison & Southern completes survey from Atchison to Lawrence.—*Mexico:* Mexican International is completed to Villa Lerdo.—*North Carolina:* Oxford & Clarksville completed from Oxford to Sassafras Fork.—*Texas:* Denison & Washita Valley completed from Denison to the Red River.—*Texas:* Paris & Great Northern will be extended from Paris to Roberts.—*Utah:* San Pete Valley will build extension from Moroni to Nanti.

New Companies Organized.—Chicago & South Side Rapid Transit files articles in Illinois.—Denison & Sherman files charter in Texas.—Denison & Southwestern files charter in Texas.—Kansas City, Arkansas & New Orleans files articles in Arkansas.—Little Rock & Hot Springs files articles in Arkansas.—Livingston & Castle Mountain is incorporated in Montana.—Pueblo Union Depot & Railroad files articles in Colorado.—Rio Grande Pacific files articles in Utah.—Santa Ana, Fairview & Pacific files articles in California. Georgia Terminal obtains charter in Georgia.

Traffic.—Anthracite coal shipments for the week ending Jan. 6 show an increase of 5.3 per cent., as compared with the same period last year; bituminous shipments show an increase of 22.5 per cent. Cotton receipts, interior markets, for the week ending Jan. 5 show a decrease of 11.5 per cent., as compared with the corresponding week last year; shipments show an increase of 3.9 per cent.; seaport receipts show an increase of .1 per cent.; exports a decrease of 29.2 per cent.; cotton in sight is greater than at the same date last year by 1.3 per cent.

Earnings.—Twelve roads report gross and net earnings for the month of November. Two show a decrease and 8 an increase in gross, and 4 a decrease and 8 an increase in net. The total net increase is $418,673, or 16.3 per cent. For the month of October 8 roads report gross and net earnings, 3 showing a decrease in gross and 4 a decrease in net. The total net increase is $1,431,898, or 7.5 per cent. For the 10 months to Oct. 31, 8 roads report their gross and net earnings, 2 showing a decress in net; the total net increase is 14.6 per cent. For the eleven months to Nov. 30, 11 roads report gross and net earnings, 1 showing a decrease in gross and 1 a decrease in net. The total net increase is $3,762,217, or 16.3 per cent.

Contributions.

Climatic Changes in Nebraska.

NEWTON, Iowa, Dec. 30, 1887.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Not long ago something was said in the *Railroad Gazette* about the increased rainfall west of the Missouri River, or in what was once known as the "Great American Desert." Without troubling myself about theory, I may say something about facts. I have before me a letter dated Plattsmouth, Neb., Oct. 21, 1869, from the then Vice-President of the Burlington & Missouri River, in Nebraska, in which he says: "If you can pick up information in regard to the character of the land between Range 9 and Fort Kearney, from men of judgment, please do so. The point is to ascertain whether the country west of Range 9 is good enough to justify us in building a railroad through it. My information leads me to think it may be good grazing country, but not fit for farming. If so, the lands we might get would not pay for building the road through it, and would afford little local business."

The company had sent two representative farmers of Eastern Nebraska to examine the territory mentioned. Because these men reported favorably, their judgment was questioned, it being taken for granted that "to spy out the *nakedness* of the land" they were sent.

Later, in 1870, the Vice-President, Chief Engineer and Land Commissioner came to my camp, then about 30 miles below Fort Kearney, and after securing an escort from that post, examined the country for themselves. It was then concluded that it might pay to build to a connection with the Union Pacific *as far west as Fort Kearney.* It will be borne in mind that Range 9 is east of Hastings, Nebraska.

As late as 1873, I remember to have disconcerted a man who was descanting with some volubility upon the attractions of the locality he had selected, by asking if he knew of 40 acres of corn west of Kearney Junction. In 1879, the few people then in Red Willow County, Nebraska, in the Republican Valley, between the 100th and 101st meridian, told me they had *tried there for nine years but had not raised a crop.*

In 1883 the acres under cultivation in Nebraska were 2,813,000; the corn crop was in 1884 122,100,000 bushels, and the wheat crop 28,325,000 bushels.

Twenty years ago it was impracticable for a "pilgrim" to go down a hundred feet for water, and when the whole face of the country was sere as a stubble field in July; when if one had not filled his keg with water in the morning, he would get pretty thirsty before the next water was reached, one was inclined to think that Fremont was not far wrong in judging of the character of a country, and giving it a name.

Changes have certainly been marked, but they have not all been climatic. In proof of this the writer may mention that when in October, 1865, he had occasion to visit a military post then in command of the present governor of Nebraska, he saw there, as a sergeant of a company of Iowa cavalry, not yet mustered out, the present Vice-President and General Manager of the Union Pacific Railroad. A.

Coffin's Treatment of Steel Axles.

CHICAGO, ILL.

TO THE EDITOR OF THE RAILROAD GAZETTE:

The extracts from Mr. Coffin's paper on Steel Axles, published in your issue of the 23d ult., do not give, I think, the entire cause of the improvement in the axles from the "treatment" he describes. Being a believer in that treatment, I should like to suggest reasons for the noticed improvement not alluded to by Mr. Coffin. I understand from these extracts printed in your columns that Mr. Coffin ascribes the entire change in the physical qualities of the steel (by sudden cooling from a high heat to that of low redness) to the retention of the carbon in the "hardening" state, and not in the "cement" or "non-hardening" state in which it occurs in annealed steel. Even if this is the case, a fact which can easily be proved by chemical means, the theory does not explain why such "treatment" would only be applicable to simple shapes, nor why quenching and subsequent annealing have been found to increase the strength and toughness of steel in every respect at each repetition of the process.

The correct explanation is probably as follows:

(1.) At a high heat (above bright redness) steel exhibits the properties of an exceedingly concentrated solution of a crystalline salt, and like such a solution is crystallized into a coarse or fine structure, according as the cooling is more rapid to a point below a bright red heat. The degree of fineness is proportional directly with the suddenness of the cooling through these temperatures.

(2.) There is a powerful kneading and binding effect on the inner part produced by the more rapid cooling of the outer than the inner layers, acting in compacting each successive layer like a forging press, only more thorough and uniform than such a forging could be. These effects produced by quenching are not obliterated by subsequent annealing, but by annealing the hardening carbon is allowed to return to its normal or cement state; and, furthermore, this explanation makes it clear why such a treatment would be only possible for simple shapes not liable to internal strains. F. A. D.

Train Running over the Stampede Switch back.

The following interesting facts concerning the methods employed by the Northern Pacific for insuring safety to trains while they are traversing the steep grades of the temporary track over the Cascade Mountains have been furnished us by the Vice-President of that road. They will be found of interest in connection with the system used by the Canadian Pacific for guarding against rear collisions, described in these columns a few weeks ago, and the examples set by both roads are suggestive in the variety of features exhibited, which are *applicable to all roads.* In a large proportion of the thousand-and-one details that must be guarded in railroad working, the principle of taking *more* than the necessary precaution, of providing a margin of safety, is universally regarded as right and valuable, and a recognition of this fact gives to the study of a system of this kind a degree of interest that is wanting if one starts out with the notion that nothing more than entertainment for the hour, or remarkable facts concerning a curiosity, are to be found.

Plans and profiles of the switchback and main line over the Cascades were given in the *Railroad Gazette*, Dec. 3, 1887.*

The special rules for trainmen are as follows:

NORTHERN PACIFIC RAILROAD.

Rules for Switchback on Cascade Mountains.

The handling of trains and engines between Easton, at the foot of the grade on the east side, and Weston, at the foot of the grade on the west side of the mountain, will be under the direction of the Switchback Trainmaster, who will have full control while trains are being piloted over the mountain.

All train crews, including conductors, must take position at a brake while passing over this grade, and be prepared to act at a moment's notice. A mountain crew will consist of one conductor and a sufficient number of brakemen including regular train crew to provide one brakeman for every two cars in the train. The conductor will handle the crew and make himself generally useful in addition to his duties of overseeing the men.

Before commencing the ascent or descent of the mountain grade, engineers must be positive that all brake equipment is in first-class order, and that they have a full supply of sand, and that it will run freely; and that the full maximum pressure of 140 lbs. is maintained on the boilers of locomotives when passing over the grade. Automatic air must be used when ascending and straight air when descending this grade.

Trainmen must thoroughly examine and test each brake in the train, and see that all are in perfect order, and that the dogs hold firm, before starting over the mountain. If any defects are discovered the attention of the car foreman must be directed to them, who will have the defects remedied. If the equipment on the engine or cars is not in perfect order, no attempt must be made to cross the grade until it is put in perfect order. Trainmen must not in any case depend upon air brakes, but must be prepared to use hand brakes in all cases to anticipate the possible failure of the air brakes.

When it becomes necessary from any cause to permit cars to stand on the mountain grade, the wheels of each car must be securely blocked, in addition to having the brakes securely set.

When a train is handled by one engine, the engine must in all cases be kept in the rear of the cars (on the down grade end of the train) both when ascending and descending; this will be done by placing the cars in front of the engine at foot of the grade and pushing them up to the tail of the first switch. The engine will then back down to clear the reverse track, the switch tender will throw the switch for reverse track and let the cars run up this track sufficient distance to clear the engine, which will then be placed in rear of the cars and push them to the next switch; and continue this method until the foot of the grade is reached.

A switch tender will be on duty at each switch. He will * * close switches for approaching trains, when the signal is given by such train.

One train only will be allowed on one side of the mountain at a time, and trains will be blocked over the mountain by telephone.

The conductor of each train will leave a clearance ticket with each switch tender as he passes up the switch. As soon as the train passes the switch the switch tender will call up the train master's office and report the train for which he holds a clearance as passed. Should the train stop or get into trouble within his hearing he must report it promptly to the train master and ascertain if the train needs assistance and report to train master soon as possible.

All concerned are enjoined to use the greatest caution while operating on the grade, and must understand that a slight neglect of duty, or any hazardous manner in performing any duty, no matter how small, may result in accident.

SIGNALS.—To close switch for ascending train two (2) long blasts of the whistle; to close switch for descending train three (3) blasts of the whistle. * *

Mr. Oakes says: "Our experience on the western divisions in the handling of trains over high grades began in September, 1883, when trains were run over a 247-ft. grade with 18 degree curves at the summit of the Rocky Mountains west of Helena, Montana, where an overhead line was constructed in advance of the completion of the Mullan Tunnel. Passenger trains were cut into two sections, automatic air was used in ascending, and direct air in descending. The distance being but 4 miles, the second section was always held until the forward section reached the other side of the mountain.

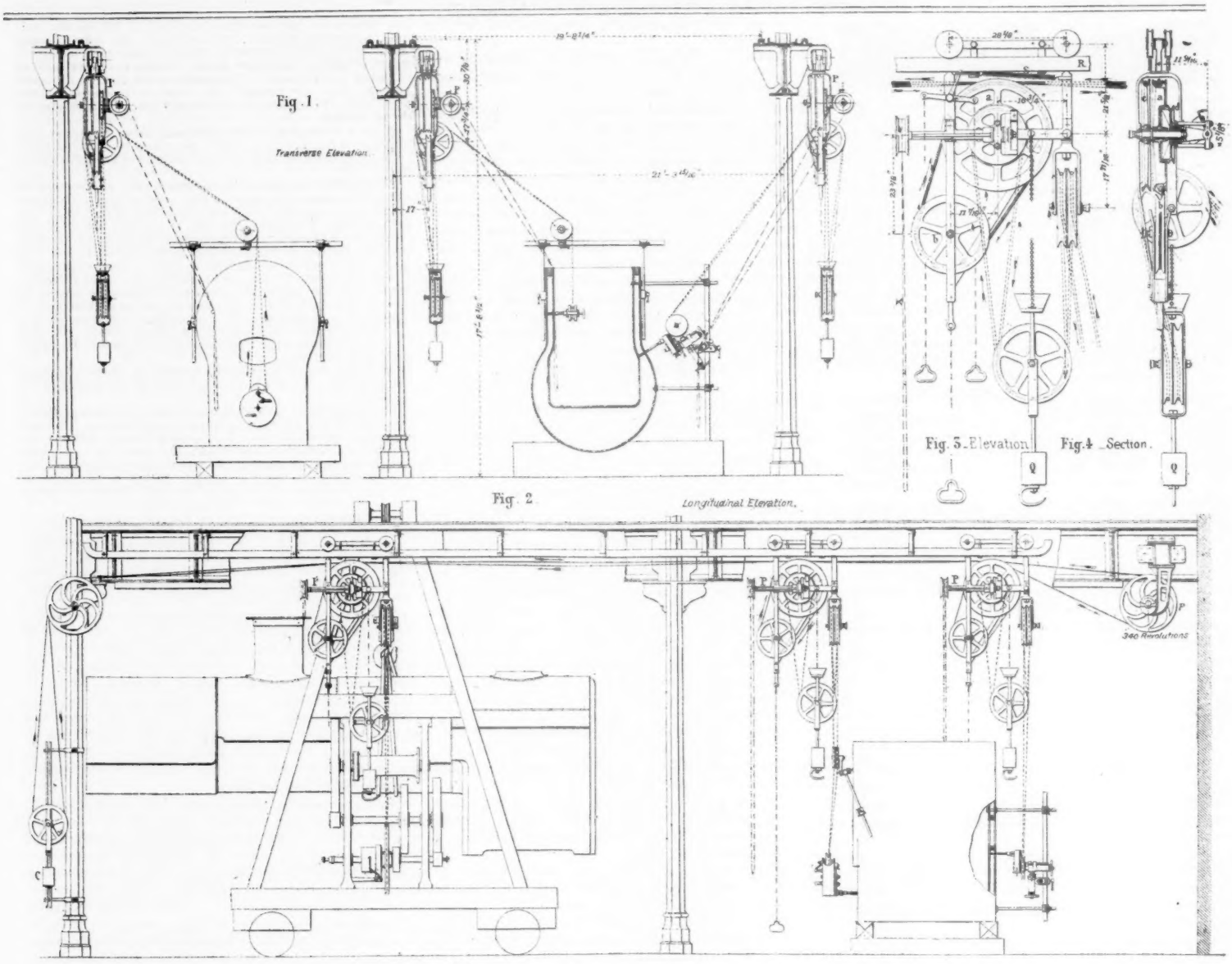
"In our regular mountain service (not the switchback) where the maximum grades are 116 ft. per mile, our rules prohibit meeting points being made on such grades, except under extreme circumstances, and in such case, the trains are thoroughly blocked, and inferior trains side-tracked before the superior trains are allowed to proceed. Trains are not permitted to follow each other in ascending or descending the mountains, except under the following conditions: a freight train is permitted to follow a passenger train up the mountain and a passenger train is allowed to follow a freight train down the mountain, but under no circumstances do we permit passenger trains to follow freight trains up the mountain or freight trains to follow passenger trains down the mountain. The reasons for these rules are so obvious I will not burden you with them. In order to avoid meeting points on the mountain, we use the block system, and when the block is very long we supplement it with safety switches, such switches being always so thrown that a descending train not under control would leave the main track, take the safety switch, and be stopped without serious damage. A switchman is always in attendance at these switches ready to close the main track for an ascending or descending train, when the whistle signal is given, but in all cases when the track is not occupied, the switch is thrown for the safety track.

"On our maximum grades we use automatic air on passenger trains ascending the mountains; automatic, with the retaining pressure valves, in descending. For freight trains we use automatic in ascending and direct air in descending. Retaining valves are not considered a sufficient safeguard for holding freight trains, and the necessity of changing at the foot of grades the valves for twenty or thirty cars would cause more delay and danger than would be incurred in using direct air, while if we attempted to use automatic in descending, the repeated application and release of the brakes would exhaust the air so rapidly that it would be impossible to keep the reservoirs supplied. The movement of all trains on the mountain is under the direct control of the dispatcher. Station operators have nothing to do with the handling of trains further than they do in all cases in the transmittal of telegraphic orders. Our passenger trains are scheduled at 16 miles per hour ascending, and 16.5 miles per hour descending; freight trains are scheduled at 8.5 miles per hour ascending, and 10.5 miles per hour descending. We run our freight trains over the mountain with hand brakes when we do not have air brake cars in the train, and our rules prescribe one brakeman for every three cars in the train, on maximum grades.

"A complete block system could be easily worked by providing safety switches at each block, and the number of trains that could be handled with perfect safety would be governed by the number of telegraphic blocks, with the requisite safety switch at each. Our blocks are from 7 to 10 miles apart, sufficient for the present volume of business; as fast as heavier service is developed, the block stations and safety switches will be increased.

"On July 1, 1887, we began operating the switch-back over the Cascade Mountains, which has a grade of 297 ft. per mile. The distance is 3.7 miles from foot of grade on east side to summit, and 3.5 miles from foot of grade at west side to summit. Up to the present time we have had no accident, although there have been several breakdowns, such as breaking axles, blowing out cylinder heads, and other

* One statement made in that description needs correction. It was then said that fourth and fifth rails were laid on 1 354 ft. of the curves. A recent letter from the Chief Engineer states that "third and fourth rails were laid on 4,791 ft. of sharpest curves."



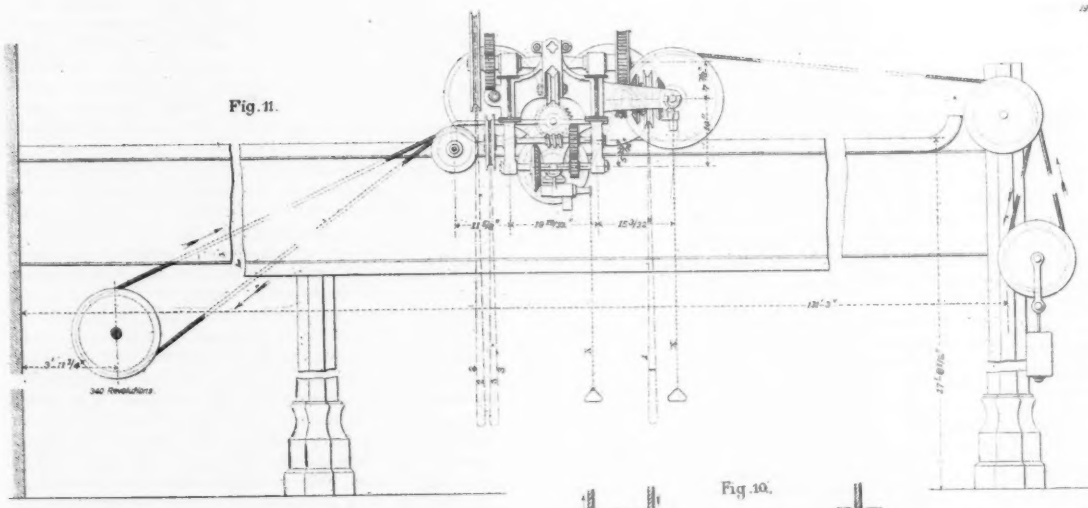
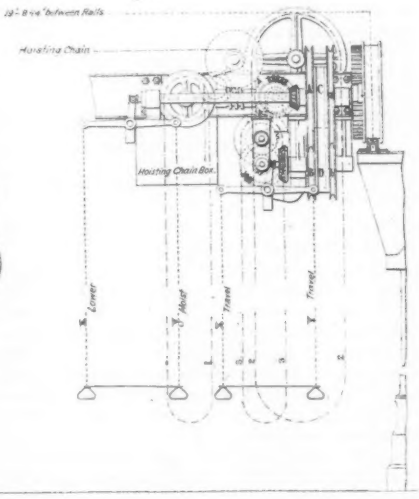
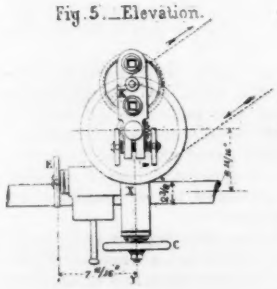
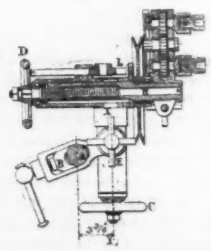
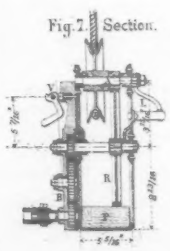


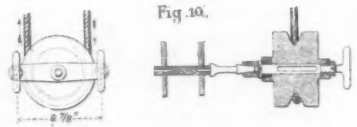
Fig. 12











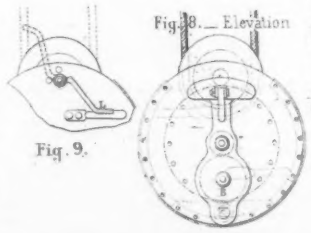
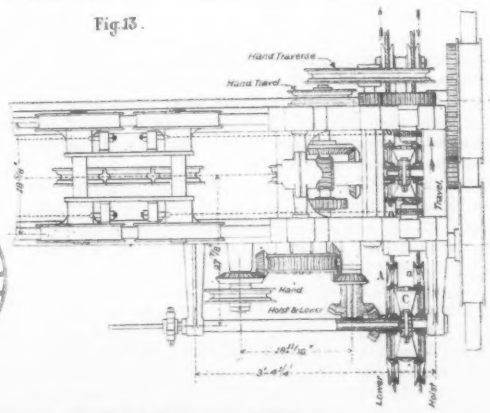


Fig. 13.



TRAVELING CRANES, PORTABLE DRILLS, ETC., DRIVEN BY FLYING ROPE—SOUTHERN RAILROAD OF FRANCE.

causes which released the air, but in all cases the trains were promptly stopped by hand, without accident or damage. When freight traffic becomes crowded, and it is necessary to make a meeting point at the summit of the switchback, we do so by clearing the track and blocking by telephone.

"As a rule we do not permit an engine to take any more cars down the incline than it can haul up. At first thought it would seem perfectly safe to take heavier trains on the downward trip, depending upon the brakes to help the engine hold the train; but if the engine should fail, the brakes would have to hold the weight of the engine as well as the train; hence this precaution.

"Our engines for mountain service on the 116 ft. grades are rated as follows: Under favorable circumstances a standard 8-wheel engine, 17 × 24 cylinders, will handle six loaded freight cars or four passenger cars; a 10-wheel engine, 19 × 24 cylinders, hauls 10 loaded freight cars or 6 passenger cars; a double header (10-wheeler and standard) will handle 10 passenger cars; a standard and a consolidation engine (cylinder, 18 × 24) will handle 13 passenger cars; a consolidation engine handles 12 freight cars; a double header (standard and consolidation) hauls 18 loaded freight cars and caboose; a consolidation engine and a 10-wheeler will handle 22 loaded freight cars and caboose. During the winter months these rates are varied from 10 to 20 per cent. as occasion requires.

"Under favorable circumstances locomotives will do the following work on the 297 ft. grades of the switchback (the motive power consists of consolidation engines and 'decapods'; the decapods have 22 × 26 in. cylinders and weigh 74 tons). A decapod will handle two 12-wheeler sleepers or three 8-wheel coaches; two decapods will handle five 12-wheel sleepers or seven 8-wheel coaches; two consolidation engines will haul three 8-wheel coaches and two baggage cars; two decapods will handle ten loaded 20-ton freight cars; one decapod will handle five loaded freight cars; one decapod and one consolidation will handle seven 20-ton freight cars; two consolidation engines will handle six 20-ton freight cars; one consolidation will handle three freight cars.

"As you will observe from the rules for the switchback, we work one engine in the rear and one in front; this is done in order to have an engine in position to hold the train should it break in two and brakes fail, either ascending or descending. We find that by one engine being in front and one in the rear the two engines will do more work than if both were in front or both in rear. This I account for from the fact that it brings the power nearer the load or resistance. So far, we have been very fortunate in our mountain service; no accident of consequence having occurred since we started in September, 1883. You will note that when it is possible to have only one engine we always keep the engine on the lower end of the train; this is done in order to have the engine hold the train in case of accident.

"The speed of all trains on the switchback is restricted to 10 miles an hour. It may be proper to add that on the switchback we have *six* switches; this enables us always to deliver trains at the end headed in the same direction that they were when received at the beginning of the grade."

Traveling Cranes and Portable Drills, Etc.—Southern Railroad of France.

Rope transmission provides a means of conveying power conveniently to considerable distances and in any direction simply by the use of pulleys for changing direction, and it seems particularly applicable in locomotive and boiler works, where the work is generally heavy and cannot be conveniently moved to the necessary machine tools. We show in the accompanying illustrations the devices adopted for rope transmission in the boiler shops of the Southern Railroad of France, where it has been used for some time. For the illustrations and descriptive details we are indebted to the *Revue Générale des Chemins de Fer.*

The shop is divided into several alleys by the posts which support the roof and carry the beams from which are suspended the overhead cranes for handling pieces weighing not more than 4,400 pounds. Each alley has a track running its whole length to carry the cranes for handling the boilers and fire-boxes of locomotives. A shaft hung below the transverse beams is carried the whole length of the building, and from this the power is taken by the rope systems. The general arrangement is shown in figs. 1 and 2. A hemp rope 0.79 in. in diameter, passes over a pulley running loose on this shaft. A friction cone serves to fix this pulley to the shaft. The rope is given the requisite tension by means of a counterweight, suspended as shown at *C*, fig. 2. The motion of the primary rope is communicated to various machines by means of secondary ropes controlled by tackle, which will be described hereafter. In the engravings the primary ropes are shown in full lines and the secondary in broken lines.

The tackle for transmitting motion to the secondary ropes is indicated by the letter P. In fig. 2 is shown the pulley *p*, which moves the primary rope. The peculiar arrangement for communicating the motion of the primary rope to the secondary ropes is shown in elevation in fig. 1, and the details are shown to a larger scale in figs. 3 and 4. The primary rope passes over the double pulley *a*, figs. 3 and 4, and changes from one groove of the pulley to the other, after going around the auxiliary pulley *b*. By this arrangement the cable is brought into contact with a large arc of the pulley. The pulley *c* carries the primary cable in its return. This pulley and *a* run loose on the same axis. The arrows indicate the direction of the motion. The pulley *d*, running loose on the same shaft as *a* and *c*, receives the secondary rope, which is kept in tension by the weight Q, and which conveys the power directly to a tool or hoisting apparatus. The friction cone, operated by the chain *X*, throws this latter pulley into gear. The whole apparatus is suspended from the rails *R* and can be freely moved from one end to the other of the alley. This is done by hand, from the ground, by means of a hanging chain. In fig. 3 is shown a brake, actuated by the spring *S*, the object of which is to hold the movable tackle in any position in which it is placed.

The convenience of this whole arrangement is obvious. Power taken from the primary cable can be applied to a tool situated in any part of the shop. In figs. 1 and 2 the apparatus is shown as applied to a traveling crane and to tools in various positions.

Special tools have been devised for use in these shops. They are made light enough to be carried from place to place, and may be quickly put in position, and can be applied to almost any part of the work, a fact which has been found of great convenience in patching corrosions or cracks occurring, for instance, in the corners of fire-boxes.

A drill is shown applied to a fire-box in two different positions in figs. 1 and 2. The same tool is shown in elevation and section in figs. 5 and 6. It is clamped by *B* to the rod *A*, which supports it and upon which it slides from one end to the other of the work. The rod *A* can be raised or lowered on the vertical supports which are attached to fire-boxes. By this arrangement the position of the drill can be changed within the length or the height of the work, and it can be turned so as to be applied in any vertical angle. It can be put in position for work by two men in about half an hour. It is desirable that the drill should be arranged to pierce the greatest possible number of holes without moving it on the rod *A*, or on its vertical supports, and it has been so designed that in one position of the supports it can drill about 25 holes. It is moved vertically by means of the screw *C*, and horizontally to or from the work by *D*. Horizontal motion in a direction perpendicular to the last is obtained by means of the screw *E*. *E* has a motion of about 2.5 in.; *C* of 5.4 in., and *H* of 6.2 in.

The shaft *H* has at its extremity a radial arm *K*, which turns through a complete circle. This radial arm allows the drill to reach the corners of a fire-box and is provided with two sockets, in either of which the drill may be placed. On the stem *L*, attached to shaft *H*, is a socket designed to receive in certain cases the return pulley of the secondary cord, as shown in fig. 1. The whole machine is pivoted horizontally around its principal axis. It is constructed entirely of iron and steel, and weighs 127 lbs., and by it all the holes in the fire-box can be drilled except eight, which must be drilled by hand before the machine can be put in position. It is found that in drilling stay bolt holes the cost by this machine is about half of the cost of drilling by hand.

The apparatus for tapping serves also to put the stay bolts in place. It is operated by the secondary cord, as shown in Figs. 1 and 2. The counterweight which gives the necessary tension to the cord, balances exactly one of the machines. This machine is guided by hand, and of course it is perfectly free to move. It is shown in detail in Figs. 7, 8 and 9. The tap or the stay bolt is carried at the end of the arm B, which turns in a complete circle around the shaft of the machine and is stopped in any position by the clamp *V*. The counterweight *P* in the lower part of the apparatus gives stability and secures the necessary adhesion of the cord. The pulley and pinion which operate the mechanism turn on the double centre shaft *A*. By raising or lowering the lever *L* they can be thrown into or out of gear. In operation the lever *L* comes against the upper handle of the machine, and is held in the hand of the workman. Releasing the lever allows it to fly up and the apparatus is thrown out of gear. This apparatus is also made entirely of iron and steel, and weighs about 88 lbs. With it can be tapped all the holes of the fire-box and all the stay-bolts can be put in place. The cost of tapping each hole amounts to about 0.6 cent. The work is done by a mechanic with an apprentice as helper. Putting in the stay bolts by the same machine cost about 0.8 cent each.

It is often necessary to cut off the end of a stay-bolt before riveting it. Another little machine has been devised for this purpose. This is shown in operation in the interior of the fire-box in fig. 1, and in detail in fig. 10. The cutter has a projection which enters the hollow stay-bolt. The pulley makes 750 revolutions a minute, and is carried in a frame provided with two handles. This also is suspended by the secondary cord and balanced by the counterweight. The cutter turns in the opposite direction to the tap, and consequently tends to draw out the stay-bolt if it is loosely screwed in.

In fig. 2 is shown the application of the movable tackle to a traveling 12-ton crane for handling a boiler. The crab can be operated either by hand or by the flying rope. The crab is geared for two different speeds, and when operated by the flying rope the load can be raised at a speed of either 1.6 ft. or 4.26 ft. per minute. It is lowered by means of a brake. It is found that the cost of handling heavy weights by power is half of that by hand.

Overhead traveling cranes were in use in the shop before the establishment of the system of rope transmission. They were operated entirely by hand, by hanging chains. The problem was to apply power by the system of ropes to these cranes and at the same time to leave them free to be operated by hand, in case there should be occasion to use them at night or Sundays, when the machinery was not running. In fig. 11 is shown the endless flying rope which operates the overhead cranes. This cord has a diameter of .79 in., and is kept taut by a weight. The part or side of the rope running in one direction operates the pulleys, which raise the load or move it in one direction; and the part of the rope running in the opposite direction operates the pulleys which lower the load or move it in a contrary direction. The first half, which raises the load, works the pulleys *a* and *b*, fig. 12 and 13. The second half operates the pulleys *A* and *B*. The pulleys *a* and *A* run loose on the same shaft and turn in opposite directions. The pulleys *B* and *b* also run loose on a common shaft. The pulleys *A a* are put in gear by the double friction cone *C* by means of the chains *x* and *y*. The same function is performed for pulleys *B b* by the double friction cone *D* shifted and put in gear by the chains *X Y*.

The speed of the flying rope is 1,620 ft. per minute, and the gearing is such that the load is hoisted at a speed of 3½ ft. per minute, and lowered at a speed of about 34½ ft. per minute. The hanging chains, 1, 2 and 3, figs. 11 and 12, serve to operate the crane by hand. The hoisting and lowering is performed by 1, 1; the traversing by 2, 2; and the traveling by 3, 3.

Apparatus for Heating, Setting and Removing Tires.

A portable apparatus for heating tires by means of the heat produced by the combustion of oil gas was illustrated and fully described in these pages several months ago.*

The engine is jacked up a few inches so as to raise the tires clear of the rails. A pipe bent to a circle is then placed round the tire and is connected to a fixed or portable bench of retorts which generate gas from oil. Suitable burners are placed in this pipe and a jet of compressed air mingles with the gas and causes jets of flame to impinge on the tire, soon heating it sufficiently. It is claimed that tires can be heated and removed without blistering the paint on the wheel.

This method of removing tires is the invention of Messrs. J. W. Gentry and G. W. O'Brien, respectively Master Mechanic and General Foreman of the Richmond & Danville, and the apparatus is made by Messrs. Pedrick & Ayer, of Philadelphia.

Some tests of this apparatus were made recently at the West Philadelphia shops of the Pennsylvania Railroad, with, it is stated, the following results:

On Sept. 22, 1887, six 48 in. tires were taken off in from 5 to 7 minutes each.

On Sept. 26, six new 48 in. tires, 3 in. thick, with standard Pennsylvania shrinkage, were put on in from 12 to 18 minutes each.

In the above tests a burning hoop 1¼ in. diameter, with ⅛ in. holes drilled 1¾ in. apart, were used.

On Oct. 20, four 68 in. tires were taken off, the average time being 15 minutes to a tire. The burning hoop was made of inch pipe with ⅛ in. holes drilled 1½ in. apart. In all the above tests, the air pressure was from 8 to 15 lbs. per sq. in., and no storage reservoir was used for the air. One pump was used located about 250 ft. from the generator. A storage reservoir was deemed necessary for a strong and even pressure of air on the gas, and one was attached prior to the test.

On Nov. 24, when two 48-in. Lehigh Valley tires were taken off, "a burning hoop of ⅝-in. pipe, with $\frac{3}{32}$-in. holes drilled 1¾ in. apart was used. These tires were 3 in. thick and had $\frac{1}{10}$ in. shrinkage, and were taken off in 30 minutes each. Two 44-in. Pennsylvania Railroad tires, with standard shrinkage, were taken off in 4½ minutes each. Next came a pair of 54-in. Lehigh Valley tires, which that company had unsuccessfully tried to take off in their own shop. These tires were rusted to the wheel centres, and these centres were both cracked in the hub around the axle. As the tire expanded the cracked centre also expanded, and this might have been carried on indefinitely without any result other than the opening of the cracked wheel centre. This centre, however, was cooled with hose, when the tire came off easily. The second, although cracked worse than the first, came off in 40 minutes. The tires taken off these broken centres were measured while hot and again after they were cool the day following, and they had expanded a full ¼ in. The tire was not round, the largest diameter was ½ in. larger than when cold and the smallest diameter was ¼ in. larger than when cold. This variation in the diameter was caused by the fracture in the hub, without unequal expansion of the centres. This test was made in the presence of Master Mechanics Kinsey, Mitchell, Clark, Hofecker and Campbell, of the Lehigh Valley, and Mr. Garrett, Master Mechanic Pennsylvania. The storage reservoir for air gave a steady and reliable pressure of air throughout. The flame was an intense blue, showing that combustion of the hydrogen was perfect, and that a great heat was consequently produced. The quantity of oil used averaged from half a gallon to 3 quarts to a tire; a gallon of oil being used up in about 13 minutes. These tests were all made in the open air and at times in the face of a strong wind, which blew the flame from the tire, causing it to work to a disadvantage as regards length of time required for each tire.

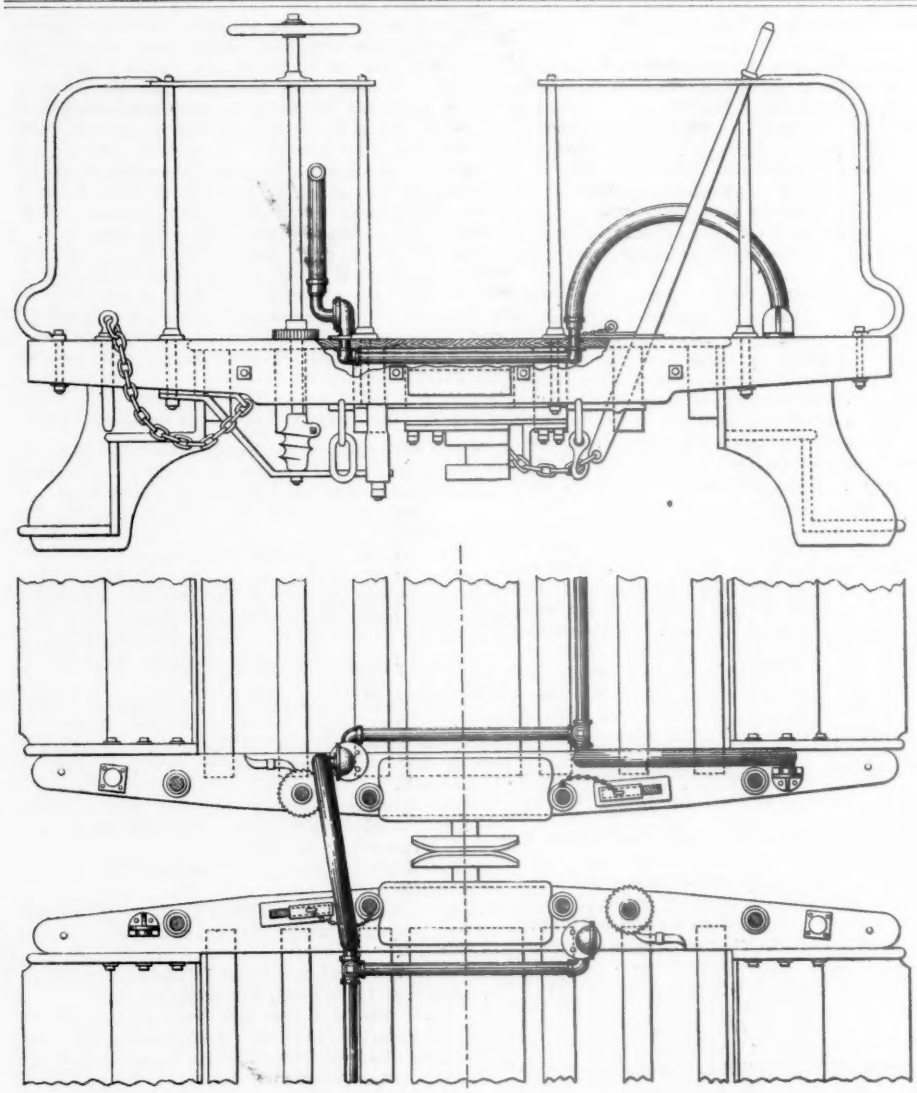
Continuous Method of Heating Cars, Chicago, Milwaukee & St. Paul Railroad.

The accompanying engravings represent the method of continuous steam heating devised by Mr. Geo. Gibbs, Mechanical Engineer of the Chicago, Milwaukee & St. Paul, and now in use on several trains on that road.

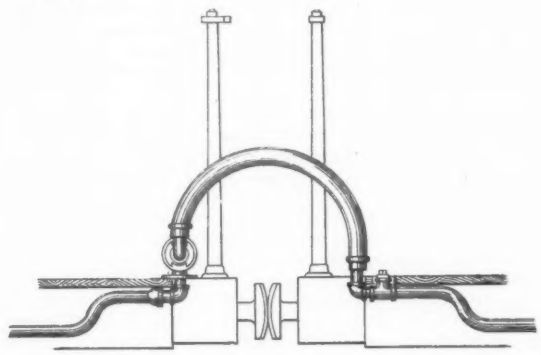
The engravings represent the steam couplings and connections between cars. No less than seven different methods of arranging the piping inside the cars are now undergoing test, and as yet experience has not shown which is the best. The engravings, therefore, do not show the arrangement of the pipes, etc., inside the car.

One method, which has hitherto given good results, is arranged to combine both heating and ventilating. In addi-

* See page 318 *Railroad Gazette*, May 12, 1887.



tion to piping along both sides of the car on the truss planks, a compact radiator, containing 40 sq. ft. of heating surface and boxed in, is placed in each end of the car between the Spear heater and the first seat. Direct connection is made between the bottom of this stack and the air injector pipe of the heater. The heated air escapes into the car through the register in the top of the box. The greater the purity of the atmosphere in cars having this arrangement is most marked. An additional important advantage is secured: in mild weather the heat radiated from the side piping is very disagreeable against a person's feet and legs. In such circumstances the steam can be entirely cut off from the side pipes, while leaving enough heating surface in the end radiators



CONTINUOUS STEAM HEATING.

Chicago, Milwaukee & St. Paul Railroad.

General View of Coupling.

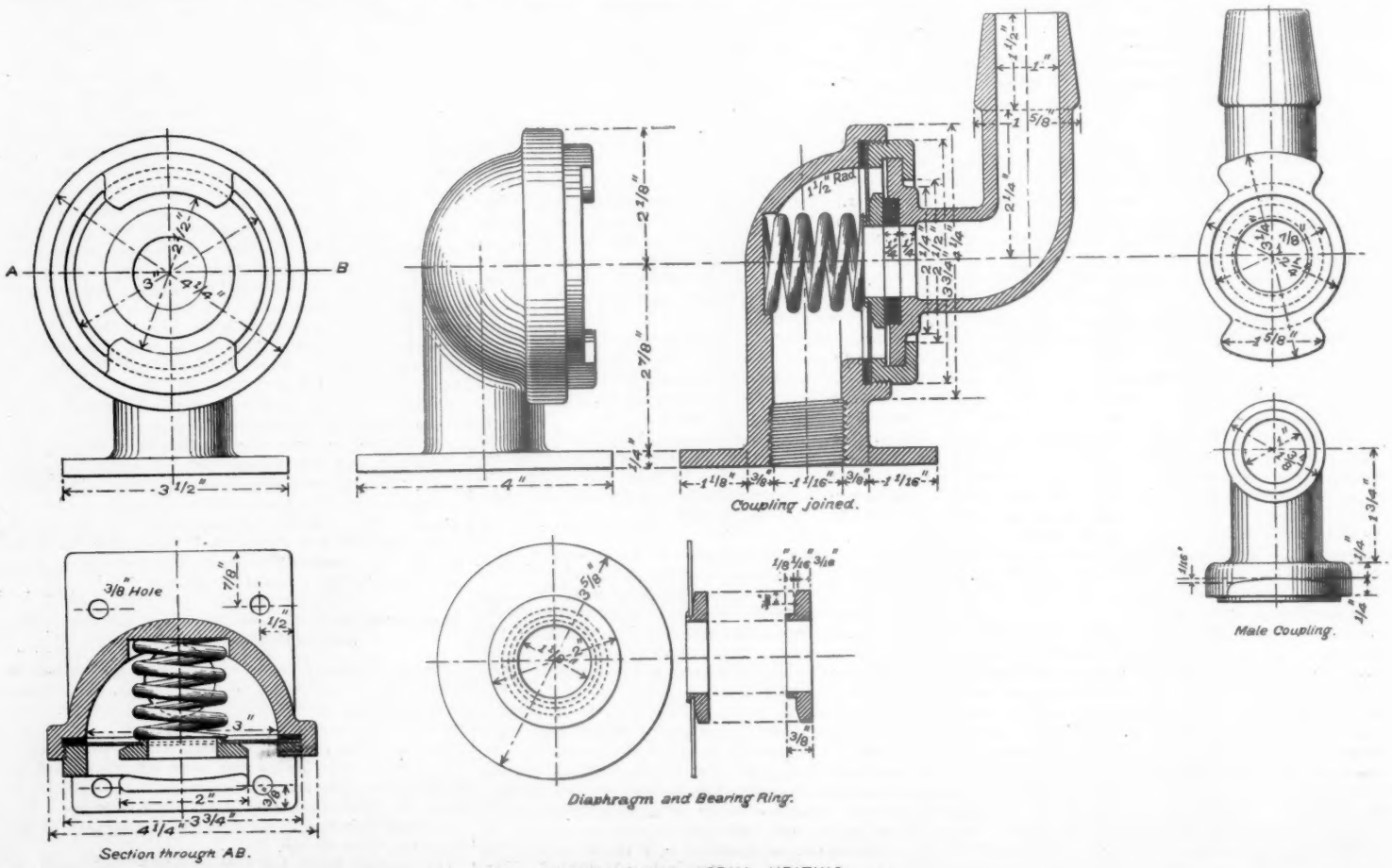
to keep the car comfortable. Underneath the car a main train pipe has been placed as usual, but a change has been introduced in the method of trapping this pipe and getting rid of condensation. Continued experience only can determine whether the plan will be successful. Only one trap has been used for each car, and this is of the ordinary expansion variety.

The couplings are designed to be placed in the end timbers of the platforms, the hose connection being bowed upward between cars on each side of passage way. The coupling belongs to that class in which the two portions are dissimilar, the male being attached to the hose and the female fixed on platform. The construction will be obvious from the detailed engravings. The female part consists of a hollow casing, adapted to receive a thin flexible diaphragm, carrying a metallic annulus in the centre, which forms one bearing surface of the joint.

This annulus is secured around a hole in the diaphragm by bending over the metal, thus allowing free expansive movement to the diaphragm without any danger of the joint becoming loose.

The diaphragm is held securely in place by a threaded ring, carrying two projecting wings, which form the clamping device, with two similar wings on the male portion. The bearings of these wings are similar curved surfaces, the purpose of which is to form a lock when the couplings are together. Coupling is effected in a vertical plane parallel to that through axis of cars, by placing the gasket of the male portion on that of the female, and rotating it 90 degrees, which brings the wings into contact.

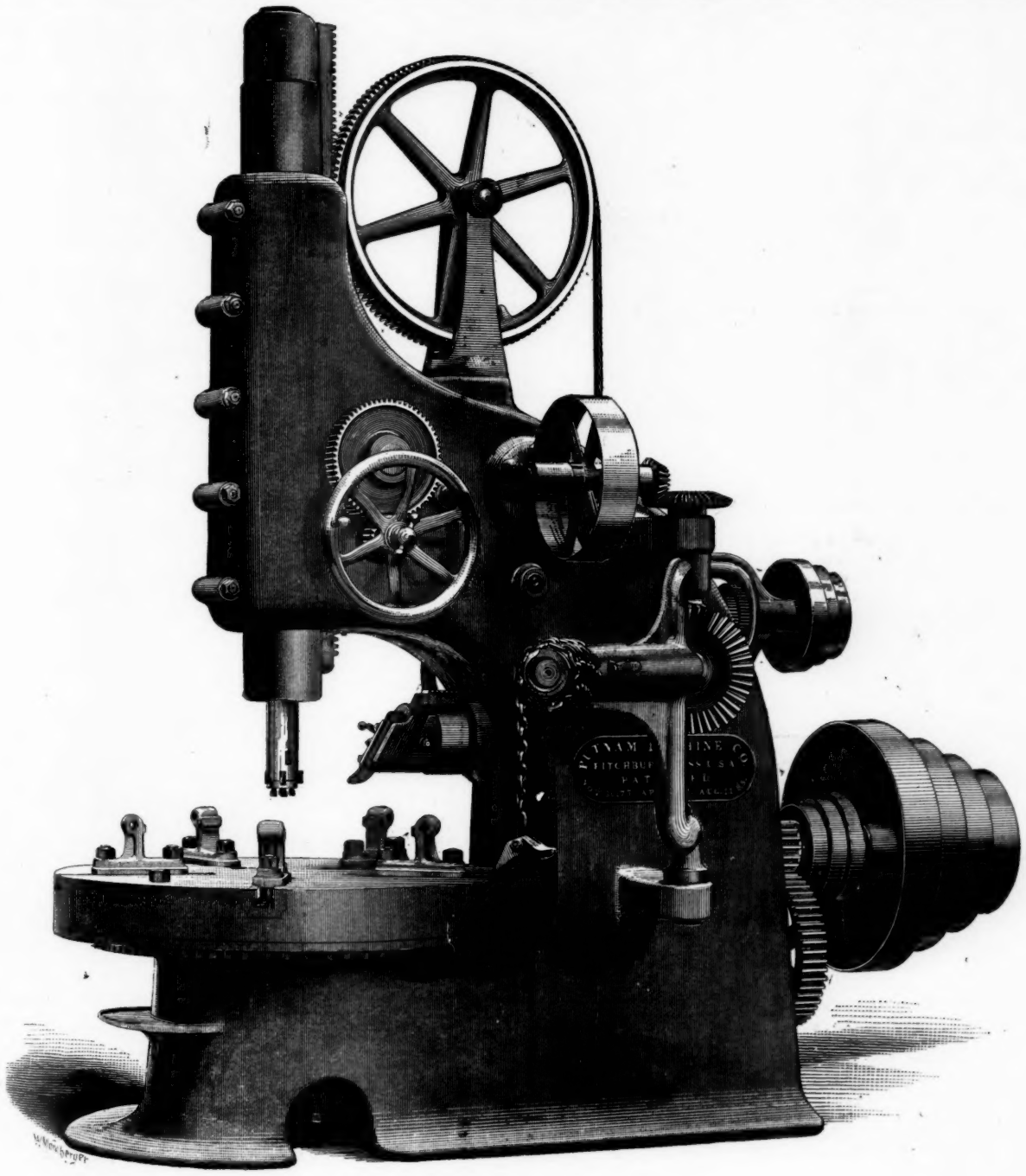
The purpose of the diaphragm is to insure an absolutely



CONTINUOUS STEAM HEATING.

Chicago, Milwaukee & St. Paul Railroad.

Details of Couplings.



IMPROVED CAR WHEEL BORER.

Made by the PUTNAM MACHINE CO., *Fitchburg, Mass.*

steam-tight joint, as when under steam the unbalanced pressure behind the diaphragm forces the annulus tightly against the gasket of the male portion. The use of soft gasket is avoided in this diaphragm-contact coupling. Two soft metal surfaces make a perfectly tight joint, but only one metal face and the hardest grade of vulcabeston gasket is used in the male coupling.

Referring to diagram of platform, the couplings are connected across the back of the end sill, and at the points of juncture with the main train pipe a three-way cock is placed, allowing steam passage to either coupling or cutting off both.

One line of hose only is used at a time, the other being kept in reserve in a "dummy coupling" ready for immediate use in case of accident.

The couplings are made the highest point in the system, the train pipe having a continual slope from them to centre of car. This is considered to confer an important advantage, making it unnecessary for the hose to be uncoupled when the cars are allowed to stand all night, and making freezing at the most vital point impossible, even through carelessness of trainmen.

Experience on the Chicago, Milwaukee & St. Paul has shown that where couplings formed a pocket, as in most of the systems of heating now on the market, great care had to be taken not to let the locomotive be disconnected any great length of time at division points when changing, on account of water lodging in the couplings and freezing rapidly there in consequence of being in contact with cold metallic surfaces. This matter of changing engines promptly is, as may be imagined, difficult to regulate at times.

Fittings and traps have so far acted admirably, and with hose connections in the present position the only critical point appears to be the trap.

Two different systems of automatic temperature regulation are now undergoing trial in two coaches. The inlet valves are operated and controlled by regulating apparatus. In one system, the Johnson, a battery of three Leclanché cells in connection with a thermostat operates an electric valve, which admits air from an auxiliary reservoir of the Westinghouse brake to the diaphragm valves, to shut and open the same and control admission of steam to piping. In three weeks of constant service no new defects have developed in the regulation, and the temperature of the coach has not varied 4 degrees at any time when in service.

In all, 24 cars and 18 engines are equipped with steam-heating apparatus, and are running on the through Chicago-Minneapolis trains, and on one local train.

Patent Improved Car Wheel Borer.

The accompanying engraving represents a car wheel borer recently brought out by the Putnam Machine Co., of Fitchburg, Mass.

The design embraces many new and desirable features which experience has suggested.

The machine is fitted with power crane, automatic safety stop and hub facing attachment.

The chuck has five jaws arranged to be operated both universally and independently, and will receive wheels from 15 to 42 inches diameter. It is claimed that wheels can be centred truer on this machine than on the old style having but three jaws.

The vertical pressure and end thrust of the cutter head is received on an anti friction ball bearing of 40 hardened steel balls 1⅛ in. dia.

The chuck spindle is of improved construction, and runs in a Babbitt-lined case, which provides for wear and retains the precision of the chuck relatively to the boring spindle.

The chuck spindle is hollow, which allows borings, chips, etc., to fall into a pit in the interior of the machine, whence they may be easily removed.

The vertical boring spindle is large and easily operated, and is provided with take-up bolts, and has six changes of feed, ranging from $\frac{1}{16}$ to $\frac{3}{4}$ in. to one revolution of chuck. The spindle can be run up into the frame so as to clear the throat of the machine and give full play to the crane.

The boring spindle has an improved arrangement, which, after the cutters have passed through the wheel, stops the machine automatically, in case the operator fails to do so.

The hub facing spindle may be operated by hand or it will advance and recede automatically without any attention from the operator except to adjust the tool to its cut.

The machine will bore the holes of car or truck wheels either straight or tapering, as desired.

The driving cone has four changes for 5-in. belt, and by an improved arrangement the momentum of the motive parts may be checked by a friction brake on the countershaft, when the machine is stopped.

The power crane can be quickly and fully controlled by the operator and will swing the heaviest wheels to the centre of the chuck, and will also remove and lower them with rapidity.

The machine weighs 18,500 lbs., and it is claimed that by its use 20 per cent. more metal will be displaced than by any other wheel borer in the market.

Each machine is furnished with countershafts, one patent cutter head, with a set of "Mushet" tools, cutter gauge, wrenches, etc.

The first of this pattern ever built has recently been placed in the shops of the Old Colony road at South Boston, the second is in use in the East Albany shops of the Boston & Albany, and the manufacturers have three more under construction for other New England roads.

Uniform Ticket Report Blanks.

The ticket auditors of a number of important roads (too numerous to name, but nearly or quite all of them representing roads of the first importance) have agreed to use for reporting to each other the sales of foreign tickets the form of blank shown herewith. There is nothing novel in the form,

	FROM	TO	FORMS.	Consecutive Nos.		No. Sold and Class.				Through Rate.		Prop'n.		Amount.	
				Commencing	Closing	1st UL.	1st L.	2nd.	Emg't.						
1															
2															
3															

uniformity being the sole object in the action taken. The absence of uniformity is so constantly annoying, even though it be in a petty way, that every officer should actively aid a movement of this kind, especially as the bettering of the conditions is so easily done, if not allowed to fail by default.

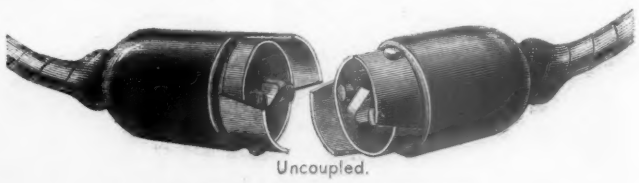
The *Official Guide*, to which we are indebted for the dimensions of the form, says:

"The sample is exactly like the form proposed in every particular, and may be used by any printer in setting up the matter or in spacing the ruling. The width of the blank is intended to be exactly 8½ in., as indicated by the space between the outer rules. The length of the blank is to be any multiple of 3½—that is, seven, 10½ or 14 inches, so as to fold to an even size of 3½ by 8½ in. in each case. We understand that Mr. A. D. Joslin, of the Illinois Central, is entitled to the credit of having taken the initiative in this movement."

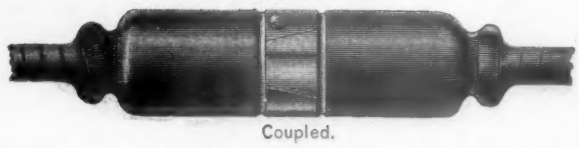
Coupling for Electrical Train Communication.

The accompanying engravings represent a form of coupler for a system of electrical train communication recently introduced by the Acme Railway Appliance Co., of Boston. The system is the invention of Messrs. Hanlon Bros., and has been used on the Boston & Maine for some weeks past, with, it is claimed, an entire absence of failure.

It is claimed that this device is not liable to be affected by weather, as it is inclosed in air-tight hard rubber casings, and that it will signal the engineer automatically when the train



Uncoupled.



Coupled.

COUPLING FOR ELECTRICAL TRAIN COMMUNICATION.
Made by the ACME RAILWAY APPLIANCE CO., *Boston.*

parts. It is operated on an open circuit with a battery, but a dynamo on the engine can be used in addition.

The construction of the coupling will be readily understood from the engravings. The outside interlocking metallic flanges protect a hard rubber casing. Electric contact is formed by sliding phosphor bronze rods, which come into contact when the coupling is effected, making the open circuit. When the coupling is severed, the circuit is closed automatically.

A trustworthy and durable electrical communication is obviously superior to a bell cord, especially on long trains.

The New York Railroad Commission—Annual Report.

The fifth annual report of the Board of Railroad Commissioners of the state of New York is for the fiscal year ending Sept. 30, 1887. The first volume is just issued. The division called "Report of the Commissioners" contains 32 pages. Of these 6 pages are given to a recapitulation of the leading features of the Inter-state Commerce act, of the findings of the Inter-state Commissioners in certain leading cases, and of the new agreement between the members of the Trunk Line Association. The commissioners then present a summary of the year's business of the roads, which will be found in our traffic column.

During the twelve months ending Sept. 30, 1887, the Board considered and disposed of sixteen references by the Governor, the Legislature and committees thereof, and numerous complaints preferred by cities, towns, associations, individuals, etc. The determinations in these matters are to be found in the appendix, to which reference is made for a full exposition thereof.

ACCIDENTS.

The record of accidents shows an increase of 29 in the total number of people killed and 122 injured, as compared with the previous year, 1886. A table gives a record of the accidents classified first as to their causes, and second as to whether beyond the control of the killed or injured, or in consequence of their own misconduct or want of caution, for the years ending Sept. 30, 1887 and 1886. Of that table we give here only the final footings.

The Board says that a careful investigation of the causes of death and injury shows that the increase was not the result of defective construction, rules or discipline, but rather of unpreventable causes or of misconduct or carelessness upon the part of those killed or injured. The increase in the total number of people killed in 1887, as compared with 1886, is due to the fact that 102 employés were killed while walking or being on track in 1887, as against 51 killed the same way in 1886. The principal cause of death and injury to passengers was getting on or off trains in motion; this was the fourth cause leading to death to employés.

The most serious cause of death to employés, as in 1886, was walking or being on the track, a danger incident to their occupation, and probably not preventable in any way. It resulted in 102 deaths and 88 injuries, as against 51 deaths and 59 injuries in 1886. The next cause of death and injury was falling from trains, engines or cars, resulting in 37 deaths and 99 injuries in 1887, as against 30 deaths and 93 injuries in 1886. In addition to the employés thus killed, there were 3 "others" killed and 9 injured, being trespassers engaged in stealing rides. The Board, in its last three annual reports, has called attention to the great danger that trainmen are subject to in setting the brakes on the roofs of freight cars, particularly in frosty weather, when the running boards are slippery, and a brakeman is liable to be thrown to the ground by any sudden jerk, or stoppage, or curve in the track. It has recommended to railroads the adoption of a low railing around the roofs of the cars to prevent this. The recommendation, however, has been disregarded by the railroads heretofore, and this year the Board submits to the Legislature a *draft of a bill to compel the adoption of such railings*, to which your attention is especially directed. Should a continuous air-brake be adopted by railroads generally, it will do much to diminish this cause of mortality to employés.

The cause leading to the third greatest number of deaths, and to injuries equal in number to all other causes, was coupling or uncoupling cars. It is to be hoped that the general adoption of the automatic coupler will, before long, materially diminish this serious cause of death and injury.

The most serious cause of death to "others" not employés or passengers, was walking or being on the track, having caused the death of 233, and injury of 124, as against the death of 247 and injury to 111 in 1886. The Board can only repeat its language in the previous three annual reports on this subject, to wit:

"The sufferers, generally, almost invariably, were trespassers, frequently suicides. The law forbids walking or being on the tracks of railroads, and makes it a misdemeanor punishable with fine; but it seems practically impossible to enforce it in this country, particularly away from the cities. In the yards and depot grounds railroads make an effort to expel trespassers, but they meet with little encouragement from the civil authorities. This is particularly true with regard to children and beggars picking up coal and cinders.

"In view of the terrible loss of life incident to its violation, the law should certainly be enforced with more vigor."

The next cause of death to "others" was being run over at highway crossings. This resulted in the death of 42 and injury to 57, as against the death of 28 and injury to 43 in 1886.

The Board repeats its recommendation made to three successive legislatures without result, viz.: that legislation be had permitting new railroads to cross highways at grade only by special order of Court, and preventing the opening of any new highway at grade, except by order of Court.

HEATING AND VENTILATION.

The Board considers but very briefly the subject of heating cars, as that is now under the regulation of special legislation; but it is earnestly urged by the Board that in the adoption of steam heating, provision be made for proper ventilation. A number of the systems do thus make such provision, and there is every reason why railroad companies should adopt it. The Board is at a loss to understand the indisposition of railroad authorities to provide for proper ventilation. There is no subject more important next to safety. It is only necessary to ride on a car properly ventilated to be impressed with the great benefits to the traveling community of the adoption of a good system. Among the first acts of the Board was to issue a circular calling attention to the necessity of improved ventilation, and suggesting the best method to secure it. At the same time a recommendation was made to have thermometers placed in railroad cars, and recommending railroad authorities to instruct those charged with maintaining the temperature of the cars to keep the thermometers as near as practicable to the point of 70°. So far from the railroad companies conforming to this most reasonable recommendation, a prominent sleeping and drawing room car company signalized its publication by removing from their cars the thermometers which they had already had there.

PHYSICAL CONDITION OF RAILROADS.

The Board is pleased to report that the physical condition of railroads throughout the state continues to improve. The system of inspections inaugurated by the Board has been attended with most beneficial results to the community and to the railroads themselves. And attention is directed to the inspection reports which will be found in the appendix. The Board had expected to make a supplemental report to the last Legislature containing the calculations of the strain sheets of the bridges within the state—a most important work. It was unable, however, to complete it in time, but trusts that by the middle of February of this year it will be enabled to transmit it. It will not repeat again the explanation of this work, but refers to the last annual report on page XV. for an explanation of its character.

LEGISLATION.

The act creating the Commission makes it its specific duty to recommend to the Legislature such laws or amendments to the present laws as the experience of the Commission may show to be necessary or expedient for the benefit of the public. This duty the Commission has conscientiously performed, but with most discouraging results.

It will again submit drafts of the bills which it has already submitted, but which have not yet been acted upon, in the hopes of a more favorable consideration than heretofore. It proceeds to briefly discuss the measures it proposes to recommend, in what it deems to be the order of their importance. The act creating the Board of Railroad Commissioners gives ample power to that body to obtain all the facts in cases of complaints, accidents or investigations. If the Board finds a grievance to exist, however, it only possesses the power to recommend its redress. The Commissioners cite the opinion of the Court of Appeals and of Attorney-General O'Brien that the Commission act fails in that the Board has no power to compel compliance with its orders, and suggest amendments to the effect that the Supreme Court *may* issue a *mandamus* to compel obedience, this to be subject, of course, to review and appeal.

The legislation recommended in the matter of highway crossings has been mentioned above.

The Board recommends the amendment of the "Leasing Act." The proposed amendments are not given in the text before us, but it is evident that close restriction if not abso-

TABLE OF ACCIDENTS REPORTED TO THE NEW YORK BOARD OF RAILROAD COMMISSIONERS FOR YEARS ENDING SEPT. 30, 1887 AND 1886.

CAUSE OF ACCIDENT.	Passengers.				Employés.				Others.				Total.			
	1887.		1886.		1887.		1886.		1887.		1886.		1887.		1886.	
	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.
From causes beyond their own control	2	35	19	52	9	72	25	149	1	10	8	12	12	117	52	213
By their own misconduct or incaution	16	50	9	31	124	618	69	327	266	201	262	197	406	869	340	555
Reported as caused by intoxication	2	2	...	4	2	2	2	1	28	25	32	28	32	29	34	33
Indeterminable as to want of caution or otherwise	2	4	2	8	64	208	63	311	16	33	12	18	82	245	77	337
	22	91	30	95	199	900	159	788	311	269	314	255	532	1,260	503	1,138

lute prohibition of leasing or consolidation is sought. The Board speaks thus of the evil which it would cure:

"An unscrupulous majority of a board of directors of a prosperous railroad have been enabled to acquire the stock and bonds of an intersecting unprofitable railroad for a mere song, a few cents on the dollar for the stock, and perhaps 50 cents on the dollar for the bonds, and have been enabled to lease in perpetuity the unprofitable road, upon the ground that it is a "feeder" to the road of which they have been the trustees and managers, guaranteeing a dividend on the stock of the unprofitable road and the interest on the bonds, which funds have come out of the earnings of the profitable railroad, to the great detriment of the stockholders thereof. This has been done to an extent of which the public at large have no idea, and has been, both in this state and elsewhere, the means of acquiring these colossal fortunes at the expense of other people's rights, which it is high time should be put a stop to."

An act to regulate the construction of railroads has been submitted to the three preceding Legislatures without favorable action, however. It is intended to prevent the unwise duplication of railroads, and provides that a corporation for this purpose cannot come into existence until a hearing shall have been had before the Board of Railroad Commissioners, and until they shall have decided that public convenience and necessity require the construction of said railroad. An appeal from the decision of the Board, however, is provided for to the Supreme Court, which body is vested with power under the act to reverse the decision of the Board should it be against permission to build the road.

The Board recommends the passage of an act to prevent discrimination against shippers by canal; an act to impose a penalty on those corporations which fail to make their quarterly reports to the Board in the time prescribed; acts concerning responsibility for fires set by locomotives, and concerning the transportation of explosives; and the act already alluded to requiring the companies to put railings around the roofs of box-cars.

The remainder of this first volume is made up of the minutes, recommendations, inspections and decisions of the Board with the text of the Inter-state act and a valuable abstract of the General Railroad Law of New York, and of the statutes relating generally to railroads.

TECHNICAL.

Locomotive Building.

The New York, Lake Erie & Western has ordered 5 passenger and 5 switch locomotives of the Rogers Locomotive Works, Paterson, N. J., to be completed the latter part of April.

The St. Louis & San Francisco has recently ordered 20 mogul locomotives from the Baldwin Locomotive Works, to be delivered by the middle of July.

The Car Shops.

The Ohio Falls Car Co., of Jeffersonville, Ind., has taken an order for 30 passenger cars for the New York, Lake Erie & Western, to be equipped with the Paige wheel.

The Lehigh Car Manufacturing Co., at Stemton, Pa., has received another order for 300 gondola cars from the Central, of New Jersey. This will make a total of 900 such cars ordered by the Central at these shops.

The Missouri Car & Foundry Co. did $2,750,000 worth of business during 1887, and at the present time are working to their full capacity—twenty finished cars per day. The contracts they have in process of execution call for 1,500 cars, distributed in part as follows: 400 box and 400 stock cars for the Atchison, Topeka & Santa Fe; 200 coal cars for the Pennsylvania; 50 coal cars for the Kansas City & Southern; 150 coal cars for the Missouri Pacific; 9 caboose cars for the Kansas City, Fort Scott & Gulf. The freight car demand promises to be as good with them as during 1887.

The Burton Stock Car Company's Works at Wichita, Kan., are completed, and the company expects to begin active operations about April 1. They are now having built by contract 8 cars per day. These cars have all the latest improvements for the comfort of cattle, sheep and horses, and are also equipped with Stimson's improved journal box.

Bridge Notes.

The Berlin Bridge Co. will build a bridge in Suffield, Conn. It will weigh about 40 tons and cost $2,950.

The bridge across the Missouri River at Nebraska City was completed Jan. 4, the Chicago, Burlington & Quincy train being the first to cross.

A $32,000 bridge is to be built at Vincennes, Ind., across the Wabash. The city officials have charge of the construction details.

It is reported that a bridge is to be built between Jeffersonville, Ind., and Louisville, Ky., to cost about $1,250,000. Plans are wanted, and information can be obtained by addressing the Hon. Jonas G. Howard, Washington, D. C.

The contract for the bridge across the Hudson River at Mechanicsville, N. Y., has been awarded to the Hillton Bridge Co., of Albany, N. Y. It will cost about $22,000.

Armstead & Joiner, of Suffolk, Va., have the contract for several bridges near Suffolk, for the Atlantic & Danville Railroad Co.

The Charleston & Gauley Bridge Railway Co. has been chartered in Charleston, W. Va.

Manufacturing and Business.

The Union Switch & Signal Co., of Pittsburgh, have just received a $10,000 contract for interlocking switches on the New York Elevated. This makes $250,000 worth of contracts furnished for that company.

Articles of incorporation were filed on the 20th by George R. and Charles D. Meneely, of Albana, and John Gibbons, of West Troy, N. Y., incorporators of the Meneely Bearing Co. The object of the company is to manufacture journal bearings and general machinery. The capital stock is $200,000, divided into 2,000 shares.

Mr. Thomas T. Wood, late superintendent of the St. Louis Malleable Iron Works, has formed a partnership under the name of Thos. T. Wood & Co., and will engage, in St. Louis, in the manufacture of Wood's patent traction engine, the Viernow patent hoisting engine and some other specialties.

The Union Indurated Fibre Co. have received eleven medals and premiums for their manufacturers in competitive exhibitions during 1887, including the highest award at the American Exhibition, London; the Mechanics' Institute Fair, Boston, Mass.; the American Institute, New York; the Fair of the New Jersey State Agricultural Society, etc.

An experiment is being made on the Atchison, Topeka & Santa Fe train running between Atchison and Topeka, Kan., of the De Meir electric bell signal, the invention of John M. De Meir, of Las Cruces, N. M.

The Zimmerman Refrigerator Car Co., of Chicago, has opened an office at 235 La Salle street, Room 5. Mr. Charles A. Robinson, formerly with the Tiffany Refrigerator Car Co., has the management.

Robert E. Libby, for some time Chicago agent of the American Brake Co., has engaged with the Thayer Manufacturing Co. of Milwaukee, though his headquarters will be at Chicago as heretofore.

Drake & Weirs, of Cleveland, O., have opened a Chicago office at Club Room 5, Grand Pacific Hotel, with Wm. S. Brewster as their representative. Winslow's asphalt car roofing is the firm's specialty.

The Holly Manufacturing Co., of Lockport, N. Y., have received two contracts recently, one from Kansas City for a 10,000,000-gallon engine, and the other from the McCormick Harvester Co., of Chicago, for a 2,000,000-gallon engine.

Hartford & Neir, engineers, of Memphis, Tenn., will move their office from Memphis, Tenn., to Chattanooga.

Iron and Steel.

The Lewisburg Steam Forge Co. will build a foundry at Lewisburg, Pa.

The Stewart Iron Co., Limited, of Sharon, Pa., report that they are starting eight puddling furnaces for an indefinite time. If the experiments prove satisfactory, they may continue operations and add to the number above stated. The puddling department of the company's plant has not been in operation for some time past.

The Laclede Plate and Sheet Mill Co., capital $50,000, was incorporated this week under the laws of Missouri, and will at once proceed to an election of officers.

With Jan. 1 the name of the company owning the Union Iron Mill, Pittsburgh, became Carnegie, Phipps & Co., instead of Carnegie Brothers & Co. The former company, therefore, now controls the Homestead Steel Works, the Union Rolling Mill and the two Lucy furnaces.

The Canadian Iron Co., which has been financially embarrassed, has been reorganized with P. Lachapelle, President; H. M. Crockett, Vice-President; Moses Toutloff, Treasurer; D. F. Wadsworth, Secretary; W. J. Officer, Mine Superintendent. The property of this mine is near the celebrated Chapin mine at Iron Mountain, Mich.

The Scranton Steel Works have just taken an order for 10,000 tons of 63-lb. steel rails for the Marietta & North Georgia Railroad.

The Cambria Iron Company of Johnstown, Pa., employing 5,000 men, have decided to make a reduction in wages of 10 per cent. on Feb. 1 (unless business improves) within a few weeks. The reduction was to have dated from Jan. 15, but was postponed.

Superintendent Goldstein, late of the Bessemer Iron Works, Chattanooga, Tenn., has taken charge of the Westest Steel Works, Carondelet, Ill. It is understood that the company will be reorganized soon with a capital of $3,000,000, and erect a Bessemer furnace with the latest improvements.

The affairs of the McDonald Rolling Mills, St. Louis, are out of court, the works and property having been sold by Receiver Ferguson to Gabriel C. McDonald, one of the brothers composing the firm of owners, A. McDonald & Bro., for $104,000.

The Italian government has made arrangements with the Bethlehem, Pa., Iron Works to furnish steel armor plates for several new cruisers designed for the Italian navy. This is the first large order ever obtained by an American firm from any of the European governments.

The Rail Market.

Steel Rails.—Market quiet, but steady, with considerable business in prospect. The price asked is $32 at Eastern mills. Sales aggregating 25,000 tons are reported for the week, taken by two Eastern works for the South and West.

Old Rails.—There are inquiries in the market for about 5,000 tons of double heads. There has been some business in small lots, among which may be mentioned a lot of 500 tons of double heads and of a 300-ton lot of tees; $22 is asked for tees, and $23 for double heads.

Track Fastenings.—A sale is reported of 8,000 kegs of spikes, and two contracts are in the market for at least 10,000 kegs each. Quotations: Spikes, $2.20@$2.25; fish plates, 2@2.10c.; bolts and nuts, 3 20@3.25c.

The Westinghouse Air Brake Co.

At a meeting of the stockholders of the Westinghouse Air-Brake Co. last week, the plan of the board of directors to increase the capital stock of the corporation from $3,000,000 to $5,000,000 was adopted. One million dollars of this increase is to go to the stockholders in the shape of a dividend, and the other $1,000,000 will be available for subscription at par.

The Rotary Steam Snow Shovel.

One of the new rotary steam snow shovels recently built for the Northern Pacific by the Cooke Locomotive Works and recently described in these pages, was put to a good practical test on Jan. 2. The switch-back over the Stampede Pass in the Cascades Division had been blocked with snow since Christmas day, there being scarcely less than 6 ft. any where and from this to 10 and 12 ft. Through travel over that division was impeded and the rotary plow was hurried west as fast as possible, the only reason it was not there before being its delay at the manufactory. The switch-back, which is seven miles long and has grades of nearly 300 ft. to the mile, was entirely cleared in one day, and the rotary worked with entire satisfaction. The second rotary had not arrived or the work would have been done much sooner, as it is intended to work them in such a way that the track can be followed from base to summit without running down to turn around at every switch.

Tunnel Under Detroit River.

An application will be made to the Dominion Parliament at its ensuing session for an act to incorporate a company to construct and work a tunnel for railways under the Detroit River, between Windsor and Detroit.

A New Track Signal.

A track apparatus was recently exhibited in New Orleans, by Mr. A. W. Berm, the design of which is to signal to an engineer in the cab the presence of a locomotive, or the fact of an open switch in any desired section ahead of him. The passing of a wheel or the throwing of a switch at one point causes, by electrical connection, an armature at another point to be so placed that it will ring a bell in the cab of a passing locomotive. No electrical connection is made with the engine signal. The action is purely mechanical. The cost of a pair of instruments for the two ends of a section is said to be $35.

The Strong Locomotive Co.

Concerning an item about this company which has lately been published, we are authorized to say that Mr. Strong is not President, Mr. S. W. Baldwin is not Treasurer, and that the company has not decided to build works at Sparrows Point. Some of the officers of that company have lately visited Sparrows Point and examined the property of the Pennsylvania Steel Co. there, but no action has been taken by the Strong Co. toward building works there.

The French Exposition of 1889.

Switzerland will take part officially in the French exposition of 1889, and it is said that a Federal Commissioner will shortly be appointed. Three hundred Swiss manufacturers have indicated their intention to take part. Geneva will be represented by 102 exhibitors. Work is progressing rapidly at the Champ de Mars, and the Trocadéro. The foundations of the palace of fine arts and of the machinery gallery are finished. The arrangement of the interior railroad is not yet decided on.

Bridge Across the English Channel.

A French paper states that a scheme for a bridge across the English Channel has been prepared by Sir John Fowler and Mr. B. Baker, the engineers of the Forth Bridge, in conjunction with Admiral Clone, M. Hersent and the engineers of the Creusot Works in France. The French government engineers are said to be favorable to the project. It is estimated that the bridge can be completed in seven years, at a cost of $200,000,000. The French abutment will be at Cran-aux-Oeufs, between Ambleteuse and Cape Grisnez, and the English terminus will be Folkestone. The entire length will be 22 miles, and as the shoals of the Varne and Colbart are followed, the course of the bridge will be slightly curved. The depth of water on the mid-channel shoals is only about 20 ft., and the greatest depth of water is about 160 ft. The piers are to be blocks of concrete and masonry, measuring 160 ft. by 100 ft. on plan and placed 1650 ft. apart. The clear headway is to be 160 ft. and the bridge will be 100 ft. wide, accommodating four lines of rail and a footway, with side tracks and signal boxes at suitable intervals. The bridge is to be illuminated with the electric light and provided with steam syrens to warn ships in foggy weather. A bridge with 66 spans, each as long as that of the Brooklyn bridge, fully merits the title of a gigantic undertaking, but it may be doubted whether it could be built for even the enormous sum of $200,000,000.

Steel Rail Production.

The *Bulletin of the American Steel Association* gives complete returns of the production of Bessemer steel rails in this country in 1887, not including a few tons which were rolled by iron rolling mills from imported blooms, but including all rails rolled by Bessemer steel works. The *Bulletin* says: "The production of steel rails by our Bessemer steel works in the first half of 1887 was 1,030,530 gross tons, and in the second half of 1887 it was 1,019,108 tons, or 2,049,638 gross tons in the whole year. This result was 487,228 tons greater than the total production of 1,562,410 gross tons of Bessemer steel rails by Bessemer steel works in 1886. The production in the last half of 1887 was only 11,422 tons less than in the first half.

Transmission of Power by Flying Rope.

According to the London *Engineer*, a flying rope was apparently first used in 1863, by Mr. Ramsbottom, for driving cranes at Crewe (England). These ropes were ¾ in. dia. when new, of cotton, and weighing 1½ oz. per foot. They lasted about eight months, and ran at 5,000 ft. per minute. The total lengths of the rope were 806 ft., 320 ft. and 560 ft. The grooves in the pulley were V-shaped, at an angle of 30 degrees. The cord was supported every 12 or 14 ft. by flat pieces of chilled cast-iron. The actual power strain on the rope was about 17 lbs., and the ropes were kept tight by a pull of 109 lbs. put on by a jockey pulley. Rope-gearing is now superseding belting and gearing in cotton mills. It has long been used in South Wales for driving belve hammers in tin-plate mills. The ropes are usually about 5¼ in. to 6¼ in. circumference, of hemp. The diameter of the pulleys should be at least 30 times that of the rope, and the shafts should not be less than 20 ft. apart. A 6½-in. rope is about equivalent to a leather belt 4 in. wide, running at the same speed—3,000 feet per minute. Such a rope will transmit 25 horse-power. The co-efficient of resistance to slipping of a rope in a groove is about four times that of an equivalent belt.

The flying ropes now used for driving cranes, etc., are generally larger and run at a lower speed than those originally used at Crewe. Speeds of 2,000 to 3,000 ft. per minute are generally considered preferable. The rope should be carefully protected from moisture, and should be composed of long staple cotton. The splices should be carefully made, and, indeed, the success of this system largely depends upon the care bestowed on the rope.

Steam Heating Notes.

Samuel C. Weisner, of Chicago, has invented a system for warming railroad cars with live steam from the locomotive. The invention may be briefly described as follows: At each side of the dome a pipe is coupled and carried under the cab, where the two pipes are brought together and by means of a portable steam-tight coupling, connected with the tender, on each side of which a pipe is fixed, and at the rear a similar coupling attaches it to the car.

A novel feature about the coupling is a cap, attached to the centre by two arms, and so arranged that when the cars are uncoupled the cap is dropped over the mouth of the pipe, thereby preventing the escape of steam beyond a small quantity which escapes through a small orfice in the cap, thereby preventing any strain upon the pipes, and keeping up a flow of steam through the pipes. The coupling for passenger cars is placed immediately under the Miller platform, and the pipes enter the car from underneath, at each side of the door, where a coil of three or more pipes is carried along the sides of the car to the end.

To guard against cars becoming cold when uncoupled from the engine, a radiator is attached to the coil in each corner of the car, and will, it is claimed, retain sufficient heat to keep the car warm for hours.

In addition a pipe runs directly from end to end of the car in the centre, which is attached to the coupling-pipe, and by means of which the supply of steam can be cut off from any car desired, in case it becomes too warm, without in any way interfering with the heating of the other cars in the train. It is claimed that the coils in each car are so arranged that condensation of steam is reduced to minimum, and is readily carried off. All exposed pipes are covered with suitable non-conductors. The couplings are all brass, without packing, and the couplings on the steam dome are so constructed that the concussion of a collision would at once close the valve and cut off the supply of steam to the cars.

An express train fitted with the Wilder system of continuous heating, as made by the New York Safety Steam Heating Co., is now running on the New York, Lackawanna & Western between New York and Buffalo. It is stated that all this company's trains will be equipped if the test proves satisfactory.

The Sewall system of steam heating is now in use on 20 or more leading roads. The company has received several orders from the Pullman Company for couplings.

Edward E. Gold & Co. are equipping 30 cars for the Boston & Providence with their system of steam heating, making a total of 60 cars already furnished with their heaters.

RAILROAD GAZETTE

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EDITORIAL ANNOUNCEMENTS.

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

The notes concerning the methods of train running on the Northern Pacific "switchback" and on other steep grades of that road, which will be found in another column of this issue, show that the chief difference between this plan and that of the Canadian Pacific is in the source of authority for the various train movements. The last-named road intrusts the station agent, or operator—or both in conjunction, where two individuals are employed—with the duty of keeping trains apart, arranging the regulations so that he ordinarily acts on his own motion, as would be the case in a regular block signal system: but the Northern Pacific adheres to the distinctive American principle of keeping all train movements in the hands of a train dispatcher or equivalent officer at headquarters. The last-named road provides for a comparatively thin traffic on a short section of road, while the system of the other is applied to a long stretch of road and is professedly adapted to a considerable increase of traffic. It will be noticed that even with the automatic air-brake it is deemed prudent to provide a force of hand brakemen; and that this principle is followed to the extent of providing enough brakemen to hold the engine as well as the cars. Those who believe in having any sort of a hand-braking force on a train will do well to bear in mind the large proportion which the weight of a modern heavy locomotive bears to that of the whole train. However much may be done in the way of furnishing efficient air or steam brakes on the driving wheels of an engine, it is to be remembered that in the event of failure of steam pressure there is no retarding power whatever for the wheels forward of the tender. If the power-brake fails and an engineman attempts to go down a steep grade depending on his reversing lever, the blowing out of a cylinder head places him in a tight place, so to speak. The average runner needs warning about keeping up pressure on unusually steep down grades, as replenishing of water supply in the boiler and cleaning of fires, usually done on down grades, often reduces the pressure to such a degree as to seriously weaken a steam brake.

Our notes of decisions cite a case in which a person standing on the platform was injured by an incoming train. The platform was so constructed that the cars projected over it. The New York Court of Appeals held that a passenger has a right to regard every part of the platform as safe, and when there, need not be on the look-out for danger. If the platform was obviously raised above the surface of the rails, it was evidently gross negligence on the part of the railroad to allow it to project inside the loading gauge of the widest car. Such a danger is easily guarded against by restricting the width of a raised platform to a proper limit. But with platforms which are level with the rails the problem of warning the passenger when he is standing too close to the track is more difficult. An obvious method of warning passengers of the danger line is to raise the platform a few inches above the rails; but though this system can be carried out at many way stations, it would cause great inconvenience to raise the platform in a Union depot, or at a meeting point of many trains, such as the New York Central Station at Buffalo. The only really safe method is to raise the platforms and enforce the rule that no passenger must cross a track except by the bridges or tunnels provided. But this system, though in use by the New York Elevated and in most of the main line stations in England, is too expensive for general use in this country, and the delay and annoyance of mounting a long flight of stairs every time the line had to be crossed is much objected to by passengers. Notwithstanding these objections, the New York Central and the Pennsylvania seem to deem this plan the only right one, as they are extending it.

A compromise method is to slightly raise the platforms except at one point in their length, where a slope to the level of the rails might be provided. This would serve as the authorized crossing place, and might be placed in charge of an official, whose duty it would be to warn passengers when the crossing was unsafe from any moving train. A few conspicuous notices posted about the station would enjoin passengers to cross only at the proper place, and the greater convenience of using the ramps ought to induce the average passenger to obey the rule made for his safety and convenience; at least if the height of the step were sufficient to make careless crossing slightly inconvenient. This plan has its disadvantages at smaller stations, especially if the platforms are exposed to ice and snow in winter; but it is worthy of consideration at large covered Union stations. The placing of trains at important junction points in positions where passengers must literally squeeze between parallel cars is well-nigh an outrage.

Governor Green, of New Jersey, in his message to the Legislature, recommends that the State Board of Assessors be constituted a board of railroad commissioners, with powers similar to those of the Massachusetts board. It is gratifying to see that the value of a commission on the Massachusetts plan is more and more widely recognized, but the idea of furnishing such a board ready-made, as it were, is not so commendable. Unless the members are selected with reference to their special fitness, individually, a chief feature of the original scheme is ignored. A railroad man, a mercantile man and a lawyer are deemed essential; tax assessors have certain qualifications and can acquire others, but a new commission will be none too good if its members are specially selected from among men of experience in the lines named. Governor Green also recommends the correction of unequal and unjust features in the state's system of railroad taxation.

The Massachusetts Railroad Commissioners have lately refused to a street railroad permission to lay a new line which would have to cross the Boston & Albany at grade three times. The line was chartered by the Legislature with the proviso that the Board of Commissioners must pass upon this point; and the whole value of the franchise is now apparently destroyed, as the line without the desired crossings is of no value. This action of the Massachusetts Commissioners embodies an important principle, and should be noted by commissioners and railroad men generally. It may be of value as a backbone stiffener in similar cases elsewhere. This proposed line was in Newton, a large and thickly settled town, and the project, considered by itself, doubtless had important merits. But safety in cases like this as well as elsewhere costs something. Somebody's interests must be sacrificed. To go on increasing dangers in one direction while great exertions to eliminate them are put forth in others impedes all progress. Commissioners who have the requisite courage can do much good in this line, and should receive the active support of all public spirited men. Even in the case of state commissions which have no specific authority in matters of this kind, the presentation of the true equities involved, in a definite and forcible manner, can be made a power of much good. Essays composed of generalities do not fill the bill.

A Cincinnati correspondent, who signs himself "E. P. C.," writing concerning the recent collision on the Cincinnati, New Orleans & Texas Pacific, which he says is officially reported to have been due to the misreading of the name of a station in the telegraphic orders—Somerset for Summit—advocates the use of the station numbers *with* the names as "Somerset 70,', "Summit 83."

In view of the care required in reading figures and the use of them to designate train numbers, engine numbers, hours, minutes and dates, which is by many deemed essential, even where words are also used, there is room for two opinions concerning the desirability of employing them in a train order for any additional purpose. The opinions of practical men vary much as to the advantage of using figures to designate numbers, time and dates in train orders. The general sentiment seems now to favor it. It economizes telegraphing, but an operator is more liable to telegraph or write a wrong figure than a wrong name; and trainmen are more liable to read figures wrongly than names, especially in view of the bad penmanship which is perhaps the rule in train orders.

The use of numbers for stations in the address of orders is apparently increasing, but whether for addresses or any other purpose the use of the telegraph call would seem to be preferable, as letters are more easily and surely remembered or fixed in the mind by the receiving operator. The numbers of stations are not, on most roads, as well known to trainmen as names, and are not so readily retained in the average mind. Without entire familiarity with the numbers their use with the names would not seem to add much, if any, in the way of safeguard.

The Pennsylvania Railroad, where it has the block signal system, places on the outside of each telegraph station the letters comprised in the telegraph call, of such size and in such position as to be easily seen by train men. These are often the only name of an office. These used by themselves or with the local name would seem to be sufficient.

But concerning the necessity of having operators who are legible penmen, and the value of a rule requiring orders to be read aloud by the conductor and engineman, in the presence of the operator, all careful men are substantially agreed. The haste with which orders are delivered and read, or used without reading, in connection with their illegibility, arising from bad writing and the thin paper almost universally used, is a fruitful source of danger. The original difficulty in this matter is the lack of care and supervision by the superior officers. Operators who are known to fall at least somewhat below a reasonably strict standard of efficiency remain undisturbed because the chief dispatcher "has not time" to carefully investigate them. Conductors and enginemen more or less willfully neglect prescribed safeguards, but yet their cases go uninvestigated, even after the men at headquarters are morally, if not officially, satisfied of the existence of the facts.

The mistake in this case would have been infinitely more unlikely to occur if the two similarly named stations had been a long distance apart, as the conductor would mentally question an order which was very much out of the usual course; and places within a moderate distance of each other could generally or always be given dissimilar names. It will be a sensible thing to change the name of "Summit." Like hundreds of other names of stations in the United States which have been given by people too lazy to select a really distinctive appellation, it is sadly devoid of individuality.

Using the names of officers for new stations is somewhat popular, especially on roads in a new country. A certain Southern president has his own name appear in the name of his road, and of the town containing his headquarters, while it also attaches to his superintendent and other subordinates, so that the letters composing it are a scarce article in the local printing office whenever his letter heads are being printed. Rather than go to such extremes as this, it would be better to honor a few of the freight brakemen or track hands with namesake towns.

The London *Railway News*, of Dec. 24, is authority for the statement that the Argentine Republic last year authorized an expenditure of £70,000,000 in railroads, £58,000,000 being under Government guarantee and £12,000,000 without such guarantee. The *News* states this to mean new construction of 10,000 miles of railroad. Although the commercial relations between the United States and Argentine Republic are slight, yet a great deal has been heard lately of the extraordinary prosperity of the River Plate, and comparisons have been made in foreign papers between opportunities offered in that country and the United States. The development of the Latin race in the southern hemisphere, under conditions analogous to those which surround the Saxon in the United States, is a subject of considerable interest to the people of this country. The Argentine Republic is substantially a vast prairie reaching from the ocean to the Andes, with a temperate climate and a rich soil. It has been aptly described as in its physical conditions similar to the State of Illinois, if winter climate were abolished.

The figures which we have quoted above will explain the recent commercial activity in that country, an activity which we are obliged to consider as abnormal and likely to be followed by violent reaction. The entire population of the Republic is stated at about 3,000,000 people, and the sudden expenditure in such a community of $350,000,000 in railroad construction, must seem like turning in a river of gold. Prices of farm lands and of city realty are said to have quadrupled within the past few years, and the receipts of railroads, and development of all agencies of transportation by sea and land have been at a rate without parallel in this country, or probably any other. The paper quoted from points out that the receipts of two small railroads, practically terminal lines at the capital, are equal per mile to those of the London & Northwestern and the Midland Railway of England. It is difficult to believe that such a condition of traffic could be permanent, even though we may readily admit an expectation of national growth and ultimate prosperity. The construction of 12,000 to 13,000 miles in the United States, with its 60,000,000 people, overloads the markets with securities, and causes anxiety in many quarters as to its ultimate effect. It is not difficult to imagine the consequences, in a community of one-twentieth of our population, of building a like amount of road in one or two years.

Scarcity of freight cars has been felt this year at numerous places where it has never appeared before, and in various other localities has manifested a severity compared with which the "attacks" of this malady in previous years were trifling. In many places the expressionists of the newspapers have had to apply the word "famine" in order to give vent to their true feelings. The *Railway Review* gives some figures which are suggestive in this connection. In Northern Iowa, Southern Minnesota and Eastern Dakota a greatly increased quantity of hay has been cut this year, so that the amount offered for shipment is out of all proportion to previous estimates. At one small station there are 5,000 tons awaiting shipment, and estimates of the total quantity in that region for the roads to carry run as high as 1,000,000 tons. Wheat is also heavy; one small town has 183.000 bushels ready and has been short of cars for months. The railroad has furnished only 511, where in the same time last year it supplied 735. The *Review* says this scarcity is because the roads have all been making extensions, and have to spread their equipment thinner to make it cover the ground.

This is undoubtedly true. The anxiety, amounting almost to a craze, which has led to the building of lines to secure "territory," has been so absorbingly directed to that one object that all other considerations seem to have been left for the future. Extensions and lateral lines have been laid with amazing rapidity, and often with the idea—so far as the outsider can judge—that it is well and necessary to get the track down whether any trains are run upon it for the first year or two or not. And, indeed, this notion has doubtless had a real influence. Managers expected only the lightest sort of traffic at first, and calculated on using more or less spare equipment from the older portions of their roads, but the enormous increase in business in 1887 has been so universally distributed, and has taxed the capacity of so many roads, that managers of ordinary prudence and forethought have on all sides found "circumstances" getting the better of them. Car shops have been full of work and managers answer complaints with the plausible statement that orders have been given for all the cars and engines that shops can furnish; but that each of the important roads which has extended its tracks in a dozen different directions has provided new equipment with equal liberality is not so clearly shown. Our table published last week showed 30,201 new freight train cars constructed in 1887, and returns since received swell the number to 41,852: but even this number serves only as a basis for estimating the total, which good judges think will reach 70.000. The last two years reported in Poor's Manual show 6½ freight cars per mile of road and 845,914 as the total in the country for 1886. At this rate we should have built 103,000 cars in 1887 to furnish an adequate supply for 150,000 miles of road. Even allowing a large margin for the varying dates of Poor's returns, and for the light traffic on most of the new track laid, there is still pretty fair evidence that the cars that are needed and cannot be found have not vanished into air or been stolen by the Canadian Pacific or Hudson's Bay road; they simply haven't been built. Mr. Poor estimates the tonnage of the country for 1887 at 545 millions; if the ton-mileage increases in the same proportion we shall have had 59⅝ billion ton-miles, an increase of 13 per cent. This is fully equal to the increase in miles of road, and indicates that the roads in the older part of the country have increased their traffic more than fast enough to use all the new cars, even if the supply of the latter had fully kept pace with the increase of road, which it has not.

Traveling Shop Cranes.

The use of traveling cranes in locomotive building and repair-shops is attended with so much economy in time and space that it is difficult to understand why such great conveniences are not more generally used. The first cost of a traveling crane is somewhat heavier than that of other lifting apparatus of equal capacity, and the supports for the traveler path are somewhat awkward and expensive additions to an existing shop. If, however, the shop is designed, these objections to their use, when built for the use of traveling cranes, disappear, and the extra cost of the traveler path and posts is offset by the reduction possible in the size of the shop and in the number of stalls. The brick piers supporting the crane path serve also to stiffen the walls and, therefore, can hardly be regarded as an extra item of expense. Traveling cranes enable the work to be done more quickly, and, therefore, a shop of given size can turn out a greater amount of work, or the same amount of work can be done in a smaller shop. If a fixed overhead lifting apparatus is used, the locomotive to be lifted must always be moved and placed under this fixed crane, and must then be taken away to some other track or stall to be repaired Thus one stall can only be used for lifting. Moreover, a fixed crane can only lift the engine at one place and cannot move it to another pit and lower it there. A drop table for wheels is even more limited in its application. As generally constructed, it can only operate upon one pair of wheels at a time, and the engine has to be moved for every pair of wheels, and it is quite incapable of lifting out the boiler or the cylinders or any other part of the engine, and is open to the same objections as the fixed crane, the work has to be moved to it and away from it. A traveling crane, on the contrary, can lift any piece of work in the rectangle formed by its extreme travel and traverse, and it is also capable of readily moving the work horizontally from one end of the shop to the other. A good traveling crane will lift a locomotive complete from one road, lower it down on another road, so as to let an engine pass out on the road originally occupied, and then pick up the first locomotive and lower it down on the first road in ten minutes. It will readily be seen that the economy in time and space is very obvious, and many shops that are now overcrowded with work and cannot be enlarged in consequence of being bounded by other shops and by streets and buildings which cannot be interfered with, except at considerable cost, could be enlarged in capacity by substituting a traveling crane for the present system of traversers and drop tables or fixed cranes for lifting locomotives.

The best method of arranging an erecting shop to be worked with traveling cranes is to use three tracks with pits running the length of the shop. The engines enter at one end on the middle track, and are lifted and placed wherever a vacant place exists on the side tracks. The wheels are thus left on the middle track, and can be rolled away to the wheel lathes, etc. The middle track can also be used for light repairs or for storing wheels, as a locomotive can be lifted several feet clear of the ground, and can be traveled completely clear of the wheels. With this method no space is lost and no traverser is required, but it is often somewhat difficult to rearrange old shops where the tracks have been originally placed at right angles to the length of the shop.

It is usual to use two cranes, each with one crab, where the pits run the entire length of the shop. One crane can be used for the front of the engine and another for the back. Either crane can be used independently for lifting boilers, cylinders, etc. This system is often convenient where some of the more modern locomotives are too long for the pits and traversers originally provided.

Where the transverse system of pits is used, one crane with two crabs is most suitable, one crab lifting the front end of the engine and the other crab the back end. This system does not so effectually utilize all the shop room and requires a traverser running the whole length of the shop. If the traverser is placed inside the shop, a good deal of room is lost and a traverser placed outside the shop has a good many inconveniences, especially in winter. In either case the traverser is an additional expense, which can be avoided where the longitudinal system is used. It may, however, happen with old shops that the connecting tracks outside the building cannot be altered so as to permit the first system to be used.

Opinions differ as to the best method of driving traveling cranes, but a flying rope running at a high velocity is very generally considered preferable to shafting, etc., as the cotton rope is light, occupies little space, and a considerable amount of power can be transmitted without any great expenditure in bearings and shaft carriers, etc. The use of worm-gearing in the crabs prevents the load running back, and an arrangement of friction clutches in the high speed gearing is easily managed and requires but little power in the shifting apparatus. Belts, however, are often used instead of friction clutches, and are by many considered preferable, being more gradual in their action and more easily shifted. When well designed, good workmanship will secure very satisfactory results with either method of construction, and provide a most valuable appliance for large shops, saving a great deal of time and labor.

Safety of Passengers on Car Platforms.

A 14-year-old boy was killed last week by being blown from a car platform on the Lake Shore & Michigan Southern, near Westfield, N. Y. He was passing from a sleeping car to a dining car on train No. 5; the train was running about 40 miles an hour, and the wind was blowing a gale, the velocity being estimated by passengers at 60 miles an hour. Not long ago a similar case was reported in the court records, heavy damages having been sued for in the case of a woman said to have been blown from a train by a cyclone. The rule that passengers must not be on a car platform is old and well settled; but the introduction of dining cars has led the roads to voluntarily break it, or, rather, invite passengers to do so; and it would appear that the risk of accident is sufficiently great to demand careful consideration.

From a legal point of view the failure of the railroad to make the passage from one car to the other safe, would undoubtly be classed as negligence. True, a railroad is not bound to adopt each new invention as fast as it appears, even though its adoption might in the particular case have prevented the injury. But gates to the platforms of cars can scarcely be said to be a very new idea, and the company in inviting the passenger to go from one car to another was bound to make the passage safe for him. This is the law in the case of a private person—the owner of grounds over which a path runs to his house or the proprietor of a building to enter which there is either an express or an implied invitation to the public—and the railroad is held to a stricter duty than the individual. As to the risk which the passenger takes upon himself in voluntarily going from one car to another while the train is in motion, it is not likely that this would be a bar. A great many decisions are to the effect that it is contributory negligence to stand on the platform of a moving train; inside the car, and not outside, is the passenger's proper place. But even where standing on the platform is prohibited by statute, and notice to that effect is displayed on the doors of the cars, the courts have nevertheless held that a passenger who is on the platform from necessity is not there wrongfully, and is not guilty of contributory negligence. A passenger is on the platform from necessity when the seats and aisles of the car are full and there is no other place to stand; he is not there from necessity when (there being room in the car) he is standing on the platform as the train approaches a station, in order that he may be the first to alight. Therefore the former recovered damages for an injury received in this position while the latter did not. A case very like the one in point was decided in the New York Court of Appeals in 1867. After the train had left the station, a brakeman came into the rear car in which a number of passengers were standing, the seats all being filled, and called out: "Go into the next car if you want seats; there are plenty of seats forward." It was a dark night and a storm was raging. A passenger in going forward slipped from the platform and was killed. The Court of Appeals ruled that the railroad was responsible, and in answer to the contention that it was contributory negligence in the passenger to pass between the cars while the train was in motion, said: "It cannot be considered negligence on the part of the person killed that she attempted to pass from one car to another in obedience to the orders of the defendant. She was not only directed to go forward into another car in the nighttime during a storm and when the train was in motion, but it was necessary for her comfort and convenience to do so." The Supreme Court of Indiana ruled the same way in a more recent case.

Vestibules such as have been put on the Pullman cars and elsewhere are undoubtedly a valuable safeguard on trains making long trips without stops, and safety de-

vices for platforms are a convenience, even if they were not a necessity; passengers going to and from the smoking car have perhaps no legal claim on the road for a safe passage, but it is well to help them nevertheless. But vestibules may not be practicable or desirable in all cases, and many roads have dining cars which will not have vestibules for some time; superintendents will therefore do well to look sharply after the discipline of the men and at the same time keep posted as to gates of less elaborate pattern than the regulation vestibule. Simple iron gates are used considerably already, notably on the Boston & Albany and the Chicago, Burlington & Quincy, not to mention the New York elevated lines, where high and uniform platforms render their use especially convenient. On three and four-track roads they are a necessity if through trains are not to be constantly delayed by slackening speed where trains are discharging passengers; and on the ordinary double-track road they are hardly less necessary. The great number of risks and narrow escapes occurring on busy lines every day and night where express trains rush past poorly lighted stations while scores of passengers are alighting, makes it a constant wonder that casualties are so few. So long as gates are not provided, and even, indeed, when they are, the force of brakemen or porters should be liberal and very well trained. The fact that only one passenger in a hundred thousand lacks the cautiousness necessary to protect himself should not be allowed to tempt trainmen to relax their vigilance in the least.

The New Trunk Line Differentials.

When the dressed meat rate was settled by giving the Grand Trunk Railroad a differential, it was evident that further changes in the same direction were likely to take place in the immediate future. In this respect the new trunk line tariff will cause no surprise. Under its operation the New York Central and the Pennsylvania are to allow the other roads a differential varying from 5 cents per 100 on first class freight to 1 cent on fifth and sixth class. The standard rate for the three highest classes remains the same; for the three lowest it is advanced 10 per cent., so that on these classes even the differential rate will be from 1½ to 2 cents per 100 higher than the existing standard rate.

Under the existing law some such differentials seem to be a necessity. Under absolutely equal rates the shippers will naturally prefer to send their goods by the best and strongest route. This effect during the last few months has not been so marked as many people expected it would be; the percentages of through traffic have remained nearly as before, the Pennsylvania, and perhaps the New York Central, showing a slight gain. But there was every reason to suppose that these changes would be greater in the future than in the past, and the clause against pools hindered the Association from equalizing matters by the diversion of freight.

While the section against pools thus prevented the weaker roads from being sure of their former share of the through business, the short-haul clause subjected them to special difficulties on their local business. A road whose through rate allowed it a good margin of profit above operating expenses could readily afford to conform its tariffs to the short-haul principle. A road without such advantages could not have the same freedom of action. The combination of the short-haul clause with the provision against pools makes it hard for the weaker roads to make money anywhere. The Commissioners' report calls special attention to this fact, as constituting one of the great difficulties in enforcing the law. It bears hardest on the weakest.

Unfortunately the weaker a road is for obeying the law, the stronger it is for making trouble. If the Grand Trunk or the Baltimore & Ohio is making no money under existing circumstances, it has nothing to lose in a fight; the New York Central or Pennsylvania, on the contrary, has everything to lose and nothing to gain. As long ago as last September, in commenting upon the Central Vermont decision of the Inter-state Commission, we pointed out the dangers arising from this inequality between the strong and the weak routes.

The present action of the Trunk Line Association is to be regarded, we think, in the light of a payment from the stronger roads to the weaker to prevent the latter from making trouble. If all the roads had been held to a system of equal rates, the weaker ones would have lost their through traffic. If the weaker roads had been simply allowed a differential below existing rates, they would have had to reduce rates for local as well as through traffic; and this would have brought their charges down so low that it would leave them no margin for making any money. The present change means practically an increase of rates on high class goods by the New York Central and the Pennsylvania. It is simply a repetition of the familiar practice of the Southern Railway & Steamship Association, in which percentages were equalized, not by diversion of freight, but by increase of rates on the route which was running ahead. The methods by which the trunk lines have reached this end are different, and the motives are different; but the general result is nearly the same in both cases. If, as we presume to be the fact, there is an implied agreement that the differentials will be revised if they are found to give the weaker roads more than their share of the traffic, the resemblance is complete.

It is too early to predict the outcome. We cannot yet tell how long the agreement will stand or how well the new rates will be maintained while it does stand. A system which artificially raises the rates on the better lines is bad economy for the country, because it sends business over routes where it is much more expensive to handle it and prevents the best lines from doing the service which they might. On the other hand, a railroad war is still worse economy, and the advantage to the community in avoiding a railroad war is cheaply purchased by an agreement which simply sends some of the traffic over unnatural routes.

The way in which they arrange these things in Central Europe is somewhat instructive. The manager of a circuitous route simply goes to the authorities of the better situated line, and says "I am in a position to compete for your through traffic. I do not specially want it, if you can make it an object for me to stay out, which you can afford to do very much better than to have a fight." The result of the discussion usually is that they submit the matter to arbitration; the better route takes the competitive traffic and pays the other routes annually, for not making trouble, such sums as the arbitrators may award. This is the recognized practice in Europe. It enables the line to take the through traffic which can handle it most economically; it relieves the weaker competitors from troublesome questions with regard to the mutual relations of local and through rates Legally, it can hardly be practiced in America; the few roads that do it are not anxious to have the fact made public. Morally it is little better than blackmail. But it throws an interesting side light on the real nature of differential rates for weaker railroads. We believe that they are a necessity of the present situation; but we believe that they are to be defended on grounds of necessity, rather than of justice or of political economy.

Dressed Beef Rates.

The complaint of the dressed beef shippers, with regard to the trunk-line charge of 65 cents per hundred from Chicago to New York, covers ground which is already familiar to railroad men. It has been a long a subject of discussion; and as late as the year 1884, Judge Cooley, in a non-official capacity, acted as arbitrator in this matter.

The feature which distinguishes this complaint from its predecessor is that it no longer seeks for an adjustment between dressed beef and live stock. The present rates are complained of, first because they are higher than they often have been, and, second, because they are unreasonably high as compared with provisions. Both of these points, and especially the second, involve a number of direct issues of fact between the complaint and the reply of Mr. Blanchard in behalf of the railroads. The difference between 65 cents per hundred on dressed meat, and 30 cents per hundred on provisions, seems on its face rather high. If, however, it should prove that provisions are not habitually carried in refrigerator cars, requiring quick movement and somewhat unavailable for return loads, the case would be entirely altered.

We imagine that the present provision rates were established on the assumption that all 4th and 5th class freight would be carried in ordinary cars by ordinary trains; but that the railroad managers have shown an increasing tendency to accommodate the shippers by moving goods at 5th class rates in refrigerator cars, and giving them other special advantages which were previously confined to dressed beef.

If this were true it would be a somewhat delicate question how far it justified a complaint on the part of the dressed beef men. Their case in comparing dressed beef and provision rates is, in some respects, weaker than when they were comparing dressed beef and live cattle. In the latter case the two things were strictly competitive; in the former case they are not. The Inter-state Commerce Commission is likely to attach importance to any difference of this kind. Nor is it by any means a mere technicality. It is only because there is a certain amount of similarity in character between dressed meat and provisions that there is so much public interest in the case.

Rightly or wrongly the public has been led to believe that the dressed beef shippers have a new process for bringing fresh meat to market which is much better and cheaper than the old methods, and that the railroads have arranged their rates in such a manner as to hinder the introduction of this new process. The attitude taken by the railroads at the beginning of the dispute concerning dressed meat and live stock rates unfortunately gave strength to this idea. We do not complain of the railroads for resisting the sudden introduction of a process which would have at once rendered a great deal of their old plant useless. The sudden destruction of this value would have been a legitimate element of cost in the charge for hauling goods under the new process; the chance for wearing the old plant out would have been a legitimate source of economy while things were gradually adjusting themselves to new conditions. It is undoubtedly true that had the railroads been compelled to make arbitrarily low rates for dressed beef, the public would have lost rather than gained, because the meat supply would have been thrown into the hands of a monopoly, and the benefits of any economy would for the time being have been wholly realized by that monopoly.

But the duty of the railroads thus to protect themselves, the old shippers, and the public, in making the readjustment gradual, is only temporary. It does not justify them in permanently standing in the way of improvements. The position that the railroads have the right to make charges which shall put the old and the new processes on an equality, is not tenable, if one process is really better than the other, and the question whether one process is really much better than the other is largely to be decided by finding out whether the difference in rates needed for securing such equality is an arbitrary one. Here is where the cost of service becomes a decisive element. *A* and *B* supply the public by different processes. If the cost of production to *A plus* the cost of carriage by the railroad, is less than the cost of production to *B* plus the cost of carriage by the railroad, and the public likes the two articles equally well, it is proof that the use of *A's* process is better public economy. And it is *prima facie* evidence that something like this state of things exists, if the railroad defends the rate which it charges *A* by saying that it adjusts its rates for the purpose of putting *A* and *B* on an equality. The public do not reason all this out, but they feel it instinctively, and the railroad men made a mistake in not recognizing it in laying their case before the public.

We hope that this mistake will not be repeated. There is less occasion for it now because the articles which are furnished the public under head of provisions are not the same as those provided by the shippers of live stock or dressed beef. But the danger of misunderstanding is not yet over. Many people believe the railroads are still interfering with the dressed-beef shippers and obstructing them by giving advantages to those who supply the public with a different article, which comes to some extent into competition with dressed beef.

We trust—we may say we confidently believe—that this opinion will be shown to be without foundation. But we must warn the representatives of the railroads against the adoption of any line of argument which, for the sake, perhaps, of some technical legal advantage, will tend to confirm this prejudice. The indirect harm from such a policy would far outweigh any possible good. And should it be found that there is any ground for the charge, it will be wise for the railroad men to make changes, even though they may involve some temporary loss to themselves and no obvious benefit to the consumer. Whatever else happens, our railroad managers cannot afford to show even the slightest appearance of resisting improvements in production.

The *Equipment Guide* says that some roads strongly object to allowing per diem on cars in shops, and have notified roads using the new system that they would not pay it. The editor of the *Guide* thinks the greater part of foreign cars going to shops need *not* wait for repair parts to be sent for from the home road, and so have no excuse for delay; he therefore approves the trunk line rule of requiring payment, especially as instances of injustice would probably offset each other.

On the question of payment of per diem for line cars by roads in the line the *Guide* does not so readily agree with the trunk lines. It holds that line cars are virtually at home so long as they are on any road which is a party to the line. But it is of course apparent that this principle would result in

constant inequalities unless each road furnished its exact quota of cars and all the roads used them in fair proportion. As in the other case inequalities would measureably adjust themselves, but it certainly tends to simplicity to treat all cars alike, and roads which like to be exact in their book-keeping will naturally favor the trunk line plan. The tendency to increased accuracy in all accounts, which actuates (or should actuate) all accounting officers, doubtless was the influence that decided the trunk lines in favor of the plan they adopted.

The meeting of Western roads at Chicago last month to consider car service plans is reported in the *Equipment Guide*. It did not take any decided action, referring the question to a committee, consisting of H. B. Stone (C. B. & Q.), J. F. Tucker (C., M. & St. P.), E. St. John (C., R. I. & P.) and K. H. Wade (Wabash). There was a good attendance and quite full expression of views by a number of general managers. The universal enforcement of a demurrage charge was advocated by several, and a number believed that the per diem plan could not be carried out without it. Mr. Holdrege, of the Burlington & Missouri River, stated that a demurrage agreement was in force at Omaha, and also one at Denver, and that both worked well. Mr. Holdrege advocated the increasing of switching rates and of proportions allowed short terminal lines on through business, in order to meet the objections of such lines and of local roads to the per diem plan. Mr. Chappell, of the Chicago & Alton, cited the fact that his road did a large business in coke between Joliet and Chicago, and stated that the income from it was so low that a per diem charge on the cars would eat it up. In other words, the road could not afford to carry the coke, except for the fact that it can borrow cars at less than cost.

This is an interesting sample of a state of things that doubtless exists at numerous places other than Chicago. The immense waste that is constantly going on by the idleness of cars, while a positive loss to the owners, is not an absolute waste, and it does not all go to fatten the selfish consignee. It would be well for managers to compare notes and get some accurate idea of how much railroads are favoring each other when they allow such important factors in the cost of transportation to be treated wholly by guesswork.

The Receivers of the Central of New Jersey have issued a report of their receivership, which began Jan. 1, 1887, and ended Dec. 31.

The results of operation were:

	10 months. 1887.	10 months. 1886.	Inc.	P.c
Earnings	$9,597 421	$8,779,529	$817,893	9.3
Operating expenses,	5,077,559	5,055,214	22,344	4.4
Net earnings	$4,519,862	$3,724,314	$795,548	21.4

The Receivers report the payment of floating debt from the former receiverships of $985,200, and of interest in default to the amount of $1,661,670, leaving neither floating debt nor interest in default at the expiration of the receivership. They expended for renewals, betterments and extensions $266,171 for back taxes, $566,053 and $325,750 in payment of car trust certificates. The amount expended for purposes other than operating expenses and fixed charges was $2,452,393. It will be remembered that the plan of reorganization included the refunding of all the existing "interest and dividend-bearing liabilities of the Central Co." except $6,850,000 5 per cent. bonds, and of funding all floating debt and defaulted interest into a new general-mortgage bond of $50,000,000, to bear not more than 5 per cent. interest. The interest and rental liabilities of the company, excepting the $6,850,000, as mentioned above, averaged 6.75 per cent. The Receivers report that out of $28,518,000 of bonded debt subject to the refunding scheme, $22,382,200 has been converted or exchanged, with a saving of $335,000 per annum in fixed charges.

The Receivers are able to announce the settlement of controversies and litigation with the Reading, the Lehigh Coal & Navigation Co., and the Lehigh Valley, and favorable traffic agreements with these and other companies. In conclusion the Receivers say:

"The beginning of the new year will find it an independent railroad, operated and controlled, for the first time in more than ten years, through a management elected by its own stockholders, with all accrued interest on its funded debt paid, all defaults cured and relieved from all the dangers and uncertainties of litigation. Its fixed charges have been so reduced as, in our opinion, to insure permanent solvency."

The company is going on at once with considerable improvements in the property. A new depot building will be erected in Jersey City at once. The drawings and specifications are now prepared, and bids are asked for. The cost will be about $400,000. Stations are also erecting at Mauch Chunk, Easton and Monmouth. That portion of the road between Jersey City and Bound Brook, which has now but two tracks, will be provided with a third track by next spring. On the whole the reorganized company begins the year under very favorable conditions.

The last legal obstacle in the way of building an elevated track by the Pennsylvania to its passenger station in Jersey City seems to have been cleared away. It will be remembered that the Board of Works, after a long delay, and in spite of strenuous opposition, authorized the vacating of Greene street and the construction of the viaduct, notwithstanding the veto of the Mayor. An application was then made to the Supreme Court for a review of the proceedings of the Board. That was refused. An application was made for an injunction, and Vice-Chancellor Van Fleet has handed down his decision denying the injunction. He holds that if the property of citizens is damaged by the projected improvement, they have their remedies, on proof of specific damage, in the courts, and that the injury which they claim that the elevation of the tracks will work is too insignificant to entitle them to the injunction. It is to be hoped that this is the end of what has looked like an unreasonable objection to a great public improvement. The grounds of objection have appeared entirely inadequate. The numerous street crossings at grade in Jersey City have long been a discredit to one of the great termini of the world, and speed, safety and economy will all be gained by the change proposed.

The Chicago, Milwaukee & St. Paul has under consideration a plan for working some 40 pneumatic gates at crossings in Minneapolis by an air compressor in the shops. A pipe line will tap a storage and equalizing reservoir in each cabin, and connect with the compressor, and cooling and drying tank in the shops. It is not proposed to lay the pipe below frost.

The figures (in round numbers) of the crop statistics for 1887, as determined by the Department of Agriculture, are given in the daily papers, and below we compare them with the figures of 1886. The average product and value for the two years were:

	1887.	1886.
Corn:		
Acres	72,000,000	73 691,208
Bushels	1,456,000,000	1,665,441,000
Value	$646,000,000	$610,311,000
Wheat:		
Acres	37,400,000	36,806 184
Bushels	456,000,000	457.218,000
Value	$309,000,000	$314,226,020
Oats:		
Acres	26,000 000	23,658,474
Bushels	659 000,000	624,134.000
Value	$200,000,000	$186,137,930

The reports of winter wheat do not show much decrease of area. Condition is affected somewhat by the dryness of the seed bed in the district that suffered from drouth, delaying seeding, germination and growth. The later rains greatly improved the situation. The average of condition is 95. The condition of winter rye coincides closely with that of wheat.

The Consul-General of the United States at Berlin reports that the agitation to increase the import duties on cereals and other articles has at last culminated in the passage of a bill by the German Parliament to secure more effective protection. The opposition to the measure was widespread. The original proposition of the Government was an increase to $1.42 per 100 kilograms, both on wheat and rye. A compromise was eventually agreed upon. The increase of duty on cereals per 100 kilograms is as follows:

Wheat from 71c. to $1.19, rye from 71c. to $1.19, oats from 35½c. to 95c., buckwheat from 23½c. to 47.6c., pulse from 23½c. to 47.6c., barley from 35½c. to 53½c. and Indian corn from 23½c. to 47.6c. On toilet powders, starch, gluten, arrowroot and sago substitutes, tapioca, from $2.14 to $2.97. On vermicelli, macaroni, from $2.28 to $3.21; on mill products of grain and pulse, from $1.78½ to $2. 49.

Through export rates from the West to European ports still figure in the news columns of the papers, though whether they are used enough to pay for printing them, or whether they are in any degree satisfactory to those who do employ them, does not appear. They seem to afford an excuse for petty irregularities, and to be used or not as may be deemed desirable in each individual case. It is now announced that the whole list has been reduced two, three and four cents per 100 lbs., the new rates being on the basis of 43 cents on provisions and 33 on bulk grain, Chicago to Liverpool.

Ticket commissions are the subject of an innocent appearing news item from Chicago, which will be found among our traffic news in this issue. Since the final agreement of all the Western roads, except the Chicago & Alton, to abide by the regulations originated by the trunk lines, little has been heard of this subject; but, like the invisible item for cigars and other things in the commercial traveler's expense account, there is reason to believe that "it is there all the same." The Chicago & Alton seems well satisfied with its boycotted position, and says that its gross passenger receipts for 1887 were 8 per cent. above those of the preceding year. As the other roads have remained remarkably quiet and no very marked squirming has been noticed among the men who formerly enjoyed considerable income on this line, there is a pervading suspicion, which is not founded on empty air, that other motives than love of justice and brotherly affection still influence the men who sell tickets at various eastern points.

In the *Railroad Gazette* of Nov. 25 last, in an article on the Future Demand for Steel Rails, a production of 2,000,000 tons for 1887 was assumed. In this week's *Bulletin* of the Iron and Steel Association, Mr. Swank puts this year's production at 2,049,638 gross tons of Bessemer rails, besides some rails rolled from foreign ingots. This is an increase of 487,228 tons, or 31 per cent. over our large make in 1886. The outlook for this year's production is not thought to be good at present, but it is improbable that the consumption will fall below that of 1886. The consumption for 1883, the year succeeding the year of our greatest building, until the last, was 10.3 tons per mile of track, and for the four years ending with 1886, the consumption has averaged 9.4 tons per mile. This rate of consumption would require nearly a million and a half tons, but the 60,000 miles of iron rails remaining in the tracks at the end of 1886 must require more than normal renewals, and most companies have earned enough to enable them to make the changes without inconvenience.

The fact that the corrugated fire-boxes of the Strong locomotive have been already removed after only a few months service does not prove that this system of fire-box is inapplicable to locomotives, but simply that the joints of the fire box must be carefully made, and in such a manner that they can be calked. It is only reasonable to anticipate that more satisfactory results will be attained when the boilermakers have gained a little more experience in the application of the corrugated fire-box to the locomotives. The Fox corrugated flue is so very widely used on steamships, that it is evident that it has many advantages over a plain cylindrica or a stayed fire-box. Many steamers with triple and quadruple expansion engines are now running at pressures fully equal to those carried in any locomotive, proving that a corrugated flue will stand the pressure, and probably further trials under more favorable circumstances will show that it possesses considerable durability, even when subjected to the hard work required of a locomotive.

NEW PUBLICATIONS.

Commercial and Railway Telegraphy. Published by J. P. Abernethy, Cleveland, Ohio. For sale by W. J. Johnston, New York.

This hand-book for station agents and railroad telegraph operators, published some years ago, has been revised and enlarged, the sixth edition having been just issued. Mr. Abernethy has collated a large quantity of facts and valuable references, and his book includes matter on almost everything connected with the duties of an agent at a small station. Much of it could be greatly improved by more editing and as the book is of only ordinary size many topics are necessarily treated in the briefest manner, but the station employé who will bear in mind that he is studying a book of sample regulations and not a set of rules which he must obey on his particular road—which, indeed, might in a given case order him to do the opposite—can learn a great deal about the details of his business. The uniform code of train rules has been added to the book, and also a number of valuable extracts from technical and telegraphic publications, though the latter are, unfortunately, sometimes given without any reference to their source or authority.

Dictionary of Railway Materials. Oct., 303 pp. Wiesbaden, 1887. J. F. Bergmann.

This book, which is admirably printed and illustrated except for the fact that it is in German print instead of Roman—an exception to the rule nowadays in German scientific publications—confines itself to articles which railroads are likely to purchase, and is in the main a sort of encyclopedic specification of such articles, supplemented by descriptions of the origin and process of manufacture of many of the more prominent materials. While it is not directly adapted for use by American railroad officials, owing to the difference of practice in the two countries, it might well serve as a basis for an American work of the same character, and large sections of it—indeed by far the largest part—would need translation only to make them directly available here. Such a book should command a ready sale among purchasing agents and all railroad officials who have to do with the purchase or testing of materials. The descriptions of processes of manufacture are at once comprehensive, comprehensible and with little unnecessary language. To the manufacture of iron into its various crude forms of cast, malleable and wrought iron and steel by the principal known processes, with the physical and chemical composition of each and its peculiar properties, 10 pages of the book are given. Rail manufacture with cuts of a Vignoles rail section and the proper form of a test piece, and diagrams of three high and reversing rolls, and of a set of bending rolls, occupies 7 pages.

The range of the book may be indicated by the first and last articles, Abziehbilder (pictures printed in color, for transfer to the panels of coaches), and Zwirn (twine). The description given of the last will show the general style and method of the book: "Twine is made by twisting together several spun-out yarn threads. It is done by twine machines. According to the number of the threads it is distinguished as 2-6 threaded twine, and according to the material as silk, wool, cotton and linen twine. Usually by twine is meant linen twine, whereas silk twine, sewing and embroidery silk, and woolen as well as cotton twine are called yarn. See sewing silk, silk twist and hemp twine." This reference is an instance of a slight defect in the cross references of the book. On turning to silk twist, one is referred again to sewing silk. To complete the above description of twine, the reference of "hemp twine" may be given, which reads: "Hemp twine must be prepared from the best hemp, firmly and uniformly twisted, everywhere round and of uniform thickness, without knots and dry, and must have sufficient strength. Should be ordered gray, black or red. Colored twine must be of fast colors. To be delivered according to sample. According to fineness per kilogram 5 to 20 marks. See spun goods;" in which further description of the general qualities of such articles and their faults of manufacture is found, while under "hemp" is given a concise statement of the qualities of good hemp and its adulterations.

The Vosburgh Tunnel. A Description of its Construction. Illustrated. Leo von Rosenberg, 35 Broadway, New York. Price, $1.

This is a handsome pamphlet of 56 pages, with maps and many illustrations. To Mr. Rosenberg, who has prepared it, was assigned, in the spring of 1886, the duty of preparing a set of drawings which would illustrate the methods employed in the construction of the tunnel. The material which he gathered for the records of the company has been supple-

mented by further data and illustrations, and the pamphlet is published by permission of the Lehigh Valley Railroad Co. The illustrations show sections of the tunnel in various materials and at various stages of the work, the timbering, the systems of machine drilling, the methods of firing and other particulars. A plan and profile of the alignment are given also, as well as progress tables, with tables of wages and contract prices. The length of tunnel excavation was 3,865.5 ft., and the arch was extended into the open cut at the east end for 16.5 ft., and at the west end for 20 ft., making the total length of tunnel 3,902 ft. The total excavation was 123,681 cubic yards, and the cost of the tunnel proper $671,947. The total cost of the tunnel and approaches and track, with miscellaneous items, amounted to about $750,000. The work is an interesting monograph on a subject of increasing importance.

A monthly illustrated paper, the *Locomotive Engineer*, makes its first appearance with the New Year. The editor is Mr. John A. Hill, formerly an engineer on the Denver & Rio Grande. The paper is well printed and illustrated, and contains many interesting and practical articles. The paper is especially intended for locomotive engineers and firemen and repair shop men, and has therefore a wide field of usefulness before it.

To the famous list of illustrated American magazines must now be added the *Iron Age;* at least that admirable paper begins its forty-first volume in a quarto form, with a cover. The new page is 9 by 13 in., but the typography and width of column have not been changed. Another change is the entire separation of the advertising from the reading pages. This change of form and new arrangement of matter will be an unquestioned convenience to the readers of the *Iron Age*, although the old page was better adapted to the display of large engravings than is the new one. The first number of the new volume contains in all 192 pages, of which 146 are advertisements. Such being the case, it seems superfluous to wish our contemporary a prosperous new year; but nevertheless, we take pleasure in extending to it the compliments of the season.

RAILROAD LAW—NOTES OF DECISIONS.

Powers, Liabilities and Regulation of Railroads.

In Virginia, a county issued and delivered its bonds to a railroad company, upon conditions, for the performance of which the company gave a bond of indemnity, secured by a deed of trust. For a breach of the conditions, the coupons remained unpaid in the hands of a *bona fide* purchaser from the company. The Supreme Court of Appeals holds that by the contract of indemnity the railroad company virtually became the principal debtor, and the county the surety, and that the creditor had the right of substitution to the benefits of the security given by the principal debtor, for the indemnity of the surety. In the same case the defendant railroad company purchased from another company, under a decree of court, certain property upon which there was a lien of a deed of trust, executed by the grantor to secure the performance of certain conditions which were the consideration of the issuance of bonds by a county to the grantor. The decree under which the property was sold adjudged the lien so created to be a valid and subsisting one, and the purchaser bought subject thereto. In an action upon the past-due coupons, brought by the *bona fide* purchaser of the bonds, the Court holds that the bonds being upon their face negotiable, the purchaser of the property could not contest the validity of the bonds, and thus relieve the property of the lien of the trust deed.[1]

In New York the Court of Appeals decides that though the statute incorporating a railroad provides that if it fails to commence the construction of its road within the time therein prescribed, such corporation shall be dissolved; the dissolution of the corporation is not effected by a mere failure to perform the condition, without judicial proceeding and judgment.[2] The Court also holds that one railroad has power to allow another railroad to use its road, and that a corporation which has capacity to contract may exercise that capacity with any party in or outside of the limits of the state, unless the law-making power of that other state forbids.[3]

By the statutes of Wisconsin, railroad companies are authorized to construct their roadbeds across, along, or upon highways, on condition that they restore such highways to their former state of usefulness. The duty is imposed by law upon towns to repair highways within their limits, and to remove obstructions therefrom. The Supreme Court holds that when a railroad company has, in constructing its roadbed along and upon a highway within a town's limits, practically destroyed the highway, the town has such an interest in the preservation and protection of the highway as will enable it to maintain an action for an injunction to compel the company to restore the highway to its former state of usefulness.[4]

Carriage of Goods and Injuries to Property.

In North Carolina, packages of tobacco were delivered at Oxford, N. C., to the Oxford & Henderson R. R. Co., to be delivered at Richmond, Va. The Oxford & Henderson, the Raleigh & Gaston, the Petersburg & Weldon and the Richmond & Petersburg were connecting roads in the line between Oxford and Richmond; the Oxford & Henderson is separate and distinct from the others, and not under the same management. The plaintiff's tobacco was received from the Oxford & Henderson, and forwarded by the Raleigh & Gaston to Weldon, a distance of about 55 miles. When the tobacco reached Richmond it was damaged by water. The shippers sued the Raleigh & Gaston but failed to recover. The evidence showed that the tobacco was all right when it was delivered by the defendant road to the P. & W. road. The Supreme Court affirms the verdict.[5]

In Kentucky a railroad company issued six bills of lading for grain shipped to the order of the shipper, per advice of M. B. & Co. The bills of lading were duly indorsed, and by M. B. & Co. delivered to a bank as security for a loan. The bank was in the habit of allowing M. B. & Co. to withdraw such bills of lading from time to time as they saw fit, and they got possession of these bills, and obtained the grain from the railroad company on presentation thereof. Failing to pay their note when due, the bank sued them, and sought to recover from the railroad company the value of the grain, claiming that the property therein passed to it by delivery of the bills of lading as security. The Court of Appeals decides that while the railroad company would have been liable to the bank if it had delivered the grain without the production of the bills of lading, the bank, by allowing M. B. & Co. to get possession of the bills of lading, and present them properly indorsed to the railroad company, was estopped to deny the legality of the delivery of the property, and that it could not recover of the company the value thereof.[6]

In Arkansas, a bill of lading given by a railroad contained the following provisions: "It is understood that railroads connecting with this line recognize this bill of lading, and will settle freight bill accordingly," and "Rates and delivery guaranteed only from F. S. to W. Cotton, $1.07 per 100 lbs." The Supreme Court holds that by this stipulation the railroad company bound itself that not more than $1.07 per 100 lbs. should be collected of the shippers for transporting cotton over its own and connecting lines to its destination, and the company must refund the excess collected. The Court likewise rules that the provisions of a bill of lading that the carrier shall not be held liable for damage to goods after they have left its own line have no relation to that part of the contract which fixes and guarantees the rate of carriage.[7]

In Michigan a railroad placed eggs received by freight in its warehouse on Dec. 11. While there the temperature from Dec. 17 to Dec. 22 was from zero to 7 deg. above. Eggs would freeze in this warehouse with the thermometer at 8 deg. above zero. The eggs were frozen when examined after the 22. The Supreme Court held that the railroad is liable for damages. The eggs were shipped by the C. & Grand Trunk Ry. Co. and the receipt given by that road limiting its liability for damages by delay, storms, etc., and expressly providing that the company should not be liable after delivery of the goods by it to any other company. At the end of its line the railroad company transferred the freight to the defendant for further shipment. The Supreme Court rules that the receipt did not affect the contract between the shippers and the defendant.[8]

In North Carolina, the Supreme Court hold that there it is not negligence on the part of a locomotive engineer to ring the bell or sound a whistle while passing over a crossing, although it may frighten horses on the road, and the railroad is liable for damages caused by horses being frightened only when the engineer has unnecessarily made a noise or has blown his whistle or rung his bell louder, or let off steam beyond what was properly incident to safely running the train.[9]

In Georgia, the Supreme Court rules that although by the law of Georgia, when property is injured by the running of a railroad train, a presumption against the diligence of the railroad company exist, yet, when the uncontradicted evidence, in an action for killing a mule, showed that the night on which it was killed was clear, but the track at the point of the occurrence was enveloped in fog or smoke so that the animal could not be seen until the train was within 50 or 60 yards, and the train could not be stopped inside of 200 or 250 yards; that the whistle was blown, and all due diligence was being used by the train-men—a verdict for plaintiff is contrary to and unsupported by evidence, and will not be sustained.[10] But in another case in the same state for the killing of stock by a train, where the evidence showed that the damage was done by a train running over and killing a cow on down grade; that at the time the engineer was on the lookout on the right side of the engine, but could not see the cow, which came up on the left side of the track; and that the fireman, who was the only other person on the engine, was at the time busy firing; the Supreme Court rules that a verdict against the company was proper.[11]

In New Hampshire the plaintiff's horse escaped into the highway and was killed upon a crossing by the defendant's train, run in a careless and negligent manner. The plaintiff was in no fault for the escape of his horse, and used reasonable diligence to retake him. The Supreme Court holds that he might recover for the loss. The running by the railroad company of their train over a crossing at an unlawful rate of speed is evidence from which a jury may find negligence.[12] In Indiana the Supreme Court holds that the law will not allow damages or compensation to one who habitually turns his horses upon a railroad company's right of way, where it is securely fenced, as a convenient way for them to go to and from the pasture field.[13]

In Wisconsin a property owner applied to the Court to compel a railroad to institute condemnation proceedings against her property, and to have her damages assessed for injury caused by the construction of the road through a street on which her property was situated. The Court found that the railroad had been built wholly on the westerly half of the street, while petitioner's property abuted on the east side, that the road-bed where it passes the property of the petitioner was raised about 15 in. above the ordinary grade of the street, but did not touch the centre line of the street, that the east half of the street had been left at about the same grade as before the construction of the road; that the construction of the road had rendered the premises much less valuable; that the failure of the railroad company to restore the street to its former condition had materially injured and destroyed petitioner's right to the use of the street; and that, in order to so restore the street, it would be necessary for the company to enter upon that part of the street to which petitioner had title in fee. On these facts the Supreme Court hold that there has been no "taking" of her property, and, therefore, she cannot recover any damages.[14]

Injuries to Passengers, Employes and Strangers.

In Massachusetts, plaintiff, the owner of a 1,000 mile coupon mileage ticket, good to bearer, over the B. & A. Railroad, had torn some of the pages from the book, for his own use, giving the balance and the book to his assistant, whom he had instructed to meet him at the depot at the terminus. The conductor refused to receive the detached coupons, for in his book of instructions was this rule: "Coupons detached by passengers will be refused and fare collected, unless passengers can show the book from which coupons were detached, which must agree in number and form." This rule was not known to the plaintiff. Refusing to pay fare, the plaintiff was ejected from the train and arrested for evading the payment of fare under the statute of Massachusetts. In an action against the railroad the defendant had a verdict, which the Supreme Judicial Court on appeal affirms.[15]

In Texas, the plaintiff, on the conductor demanding his ticket, searched for and failed to find it, but informed him that he had one and requested him to wait until he found it. The conductor refused and immediately stopped the train and ejected him between two stations. Afterwards the plaintiff found his ticket in the lining of his coat. The Supreme Court holds that a verdict against the company for $500 damages was not too much; that the conductor was bound to wait a reasonable time for him to produce his ticket; and the question, what is a reasonable time, is one of fact to be found by the jury.[16]

The Supreme Court of Arkansas decides that where it is a published rule of a railroad company that passengers are forbidden to ride on "through" freight trains, the fact that passengers had often before been allowed to ride on such trains will not deprive the company of its right to begin the enforcement of the rule whenever it pleases; and, in the absence of any appearance of the train's being held out for the carriage of passengers, the conductor of the train may eject from it any one who attempts to ride as passenger. The Court further says that such ejection is not a violation of the Arkansas statute forbidding railroads to eject passengers for non-payment of their fares at places other than stations.[17]

In Texas, a man was riding on the hand-car as a passenger by invitation of defendant's trainmaster and dispatcher, who had charge of all freight and passenger trains, but it was disputed whether hand-cars and their crews were under his control or that of the general roadmaster. He was killed, and his representatives sued the company. The Supreme Court rules that it was a question for the jury whether or not the trainmaster had any authority to let the man ride on the car.[18]

In New York the Court of Appeals hold that where the cars of a railroad company are so constructed that in coming into a depot they project over the platform of a depot constructed for the use of passengers, and they, while quickly coming in there, strike and injure a person rightfully standing on such platform who had just arrived from another train, and who did not see the train approach which injured him, heard no signal, and did not know or see that there was a track for that train, the jury are authorized to find that the injury was the result of negligence of the company. A passenger has a right to regard every part of a platform at a station as safe; and need not while there be on the lookout for danger.[19]

In Georgia the Supreme Court rules that where an employé of the Port Royal & Augusta Ry. Co. was killed while riding on a car over a connecting line belonging to the A. & K. R. R. Co., owing to the defective construction of the latter's line, the widow of deceased is entitled to maintain her action for damages for his death, whether deceased was a co-employé of the persons on the A. & K. line or not.[20]

In Kentucky in an action by an employé for injuries received in consequence of the neglect of the railroad to construct a suitable railing around an elevated platform upon which it was necessary for the plaintiff to stand while adjusting certain machinery, he alleged that he had been in the employ of the defendant but three or four days when the accident occurred, and that defendant had been warned of the dangerous condition of the platform, and that he had promised that a railing should be placed around it within a reasonable time. The Supreme Court rules that it cannot say as a matter of law that three or four days was a reasonable time, and therefore the plaintiff has not proved any negligence on the part of the railroad, and cannot recover damages.[21]

In Texas the Supreme Court decides that if an employé is subject to the orders of a superior, by whom he is directed to perform acts not within the line of his ordinary duties, and it is customary in the employer's service for employés to obey orders to do duty outside of their regular employment, such employé is not precluded from recovering for injuries received while so acting under his superior's orders.[22] In Tennessee it is held that the conductor of a train and the telegraph operator at a station are not "fellow servants."[23]

In Michigan, in an action against a railroad company for the killing of a pedestrian, it was shown that deceased was a man in the full possession of his senses, but that he was subject to spells of absent-mindedness; that at the time of the accident he was walking on the tracks of the defendant without permission, though he had been accustomed to do so, as had some others; that the engineer of defendant's train saw him about the time the train should have whistled for a crossing, and gave the usual whistle and when within 40 rods of deceased again whistled sharp and full; that deceased paid no attention to it, and when, within 300 or 400 ft. of him, the engineer sounded the danger whistle, until the engine struck the deceased; and also applied the brakes, and made every possible effort to stop the train; and that from the time the whistle was sounded deceased had ample time to get off the track. The Supreme Court holds that the evidence was sufficient to justify the trial court in directing a verdict for the defendant.[24]

In Iowa the plaintiff's horses were killed and his wagon damaged by a collision with a train of the C., B. & Q. R. R. Co., at a street crossing. The street was also crossed by the R. Railroad, the track of which lay 100 ft. to the north and parallel to that of defendant. A person at the R. crossing could see up defendant's track to the east about 1,100 ft., but about 500 ft. of this view was obstructed by a long building standing near defendant's crossing. The team was in charge of two employés of plaintiff, who were familiar with the crossing. They were driving south in the day-time, and when passing over the R. crossing they looked up and down defendant's tracks. Seeing no trains they walked the horses toward the crossing, which they reached in 15 seconds, and the team was then struck by a mail train running west 25 miles an hour, which the men did not notice until it was 20 ft. distant. The engineer saw the horses' heads when he was about 200 ft. off, but, thinking that the driver would pull up, he made no attempt to stop until he saw them keep on. The men in the wagon did not stop and listen at any time, but they looked up defendant's tracks to the west as they approached the crossing. There was conflicting testimony as to the ringing of the bell. The Supreme Court affirms a verdict against the C., B. & Q. Co.[25]

In Indiana the Supreme Court decides that a person who has knowledge that a train of cars is stopping temporarily at a way station on the way to its destination has no right to assume the risk of passing between the cars. It is a danger so immediate and so great that he must not incur it. The direction of a brakeman to a person to pass through a train standing on a highway will not justify him in attempting to pass between the cars where the danger is obvious.[26]

[1] Washington, O. & W. R. R. Co. v. Casenove, 3 S. E. Rep., 433.
[2] Day v., O. & L. C. R. Co., 9 Cent. Rep., 459.
[3] Id.
[4] Jamestown v. C., B. & N. R. R. Co., 34 N. W. Rep., 729.
[5] Knott v. Raleigh & G. R. R. Co., 3 S. E. Rep., 735.
[6] Douglas v. People's Bank, 5 S. W. Rep., 420.
[7] Little Rock & F. S. R. R. Co. v. Daniels, 5 S. W. Rep., 584.
[8] Burroughs v. G. T. Ry. Co., 34 N. W. Rep., 875.
[9] Morgan v. Norfolk Southern R. R. Co., 3 S. E. Rep., 506.
[10] Georgia R. & Bank Co. v. Wilhoit, 3 S. E. Rep., 698.
[11] Northeastern R. R. Co. v. Martin, 3 S. E. Rep., 701.
[12] Clark v. B. & M. R. R. Co., 5 N. Eng. Rep., 48.
[13] Ft. Wayne, C. & L. R. R. Co. v. Woodward, 11 West Rep., 101.
[14] Heiss v. M. & L. W. R. Co., 34 N. W. Rep., 916.
[15] Marshall v. Boston & Albany R. R. Co., 5 New Eng. Rep., 172.
[16] International & G. N. R. R. Co. v. Wilkes, 5 S. W. Rep., 491.
[17] Hobbs v. Tex. & Pac. Ry. Co., 5 S. W. Rep., 586.
[18] International & G. N. R. R. Co. v. Cock., 5 S. W. Rep., 635.
[19] Archer v. N. Y., N. H. & H. R. R. Co., 9 Cent. Rep., 233.
[20] Kilian v. Augusta & Knoxville R. R. Co., 3 S. E. Rep., 621.
[21] McDowell v. Chesapeake, Ohio & Southwestern Ry. Co., 5 S. W. Rep., 413.
[22] East Line R. Co. v. Scott, 5 S. W. Rep., 501.
[23] East Tenn., V. & G. Ry. Co. v. De Armond, 5 S. W. Rep., 600
[24] Boumeester v. Grand Rapids & Ind. R. R. Co., 34 N. W. Rep., 414.
[25] Nosler v. C., B. & Q. R. R. Co., 34 N. W. Rep., 850.
[26] L. S. & M. S. R. Co. v. Pinchin, 11 West. Rep., 247.

THE SCRAP HEAP.

A Dishonest Brakeman.

A Bridgeport (Conn.) dispatch of Jan. 5 says: A brakeman named Pearson of the New York, New Haven & Hartford was yesterday suspended and accused of stealing tickets. Pearson ran with Conductor Edward Manning, and Manning was in the habit of having Pearson assist him in sorting

tickets in the baggage car. Pearson confessed to have stolen about $600 worth of these tickets, which he afterward sold to New York scalpers.

Lake and Coastwise Tonnage.

United States Commissioner of Navigation Morton in his annual report says that the tonnage on the great lakes increased 21,161 tons during the fiscal year ending June 30, 1887. The gain on the Pacific coast was 8,761 tons and about the same on Western rivers. The total documented tonnage of the United States was 4,105,844 tons, distributed as follows: Atlantic and Gulf, 2,638,272; Pacific coast, 356,445; northern lakes, 783,722; western rivers, 327,405. The foreign-going registered tonnage was 1,015,562 tons.

Inventing New Devices for Locomotives.

When any man attempts to improve any existing kind of machinery he should first make himself thoroughly acquainted with the machines in use as well as with every detail of their use. Not so with the genius who has got a new notion in his head about some change or other on the locomotive. He deliberately sets up posts and rods close to track to catch some hook he is going to put on engine that will turn some distant signal or ring a bell, or set the brake, regardless of how many heads it will take off besides. He puts a smoke-consuming device in the stack to eat smoke that eats most of the draft, some smoke, and sends the rest out of the ash pan to deaden the glare of the varnish on the cab. He puts a patent damper on that stands proudly up in the centre of the deck and reminds the fireman that it is there at every turn. He puts a device on top of dome to save the steam wasted at the pop, and proposes to return its heat to boiler, and generally succeeds in getting everything else too hot to work—including the engineer. He gets out a new valve motion that does the work about as well as the link and perhaps a little better, but at the cost of twice as many parts, cost and wear. He gets up a self-closing glass gauge-cock that don't close. He invents a boiler compound that prevents scale from forming,and also soaks the form of steam so you can't drag it through the cylinders. He invents a 1,000-mile dope that will help the journals to melt in half that distance. He invents a side-shoot pilot that will throw a yearling bull over into a ten-acre field and not hurt him, but it throws a man into a wire fence. He invents a fire-box and stack that keeps cinders out of the car windows and don't let the water in boiler get hot enough to shave with. He puts a snow flanger under the pilot that comes off and ditches the engine. He invents a steam bell ringer that will keep you from ringing the bell all summer and freezes up and won't let you ring it in winter—or won't ring it for you. And thus the improvers keep nagging away; once in a great while they hit it, but the rest of the time they hit something or somebody else. Many of the parts and appliances of locomotives are crude and unhandy, but the principles are all right and only want the details carefully considered and improved to make them all that can be hoped for.—*Locomotive Engineer.*

Capital of Transvaal Gold Mining Companies.

The London *Times* prints a list, confessedly incomplete, "chiefly in order to bring home to the public how considerable the gold mining industry of the Transvaal already is." It may be summed up as below:

	No of companies.	Paid up capital.
De Kaap District and Moodies	65	£1,759,900
Witwatersrandt District	25	1,007 750
Lydenburg and other districts	8	2,085,600
Total	98	£4,853,250

Of the above companies eight with an aggregate capital of £2,017,000 have offices in London. One of the mines included above, Piggs Peak, with a paid up capital of £200,000, is in Swazieland. All accounts of the yield per ton are favorable, though some of the machinery seems defective.

The Transvaal Congress have decided that no other railroad except the Delagoa-Pretoria line is necessary at present, thus turning their backs on the offers of the authorities of the Cape Colony.

X. & Y. R. R. Drawing Office—Rules for Guidance of Draughtsmen.

The company does not pay you for doing more than you can possibly avoid. Your superior officers will take you for a fool if you endeavor to appear industrious.

You are required to go to the closets twice a day, and should always take one, but not more than two newspapers along with you, which you should read through entirely, advertisements included, so as to keep yourselves posted on all prize fights, theatrical gossip, scandals and murders. Do not take more than two papers at a time with you to the closets, as it keeps your fellow draughtsmen waiting too long.

If you have anything very interesting to read do not fail to read it, and for appearances sake keep the paper or novel half covered by your dust cloth, under which it can be slid if any one comes in on you too quickly.

When the C. D. is out of the office always carry on as animated a conversation as possible, and as you cannot all talk at once, those who are not talking or reading should whistle or sing to keep their spirits up. In fact it is a good rule to whistle or hum tunes always, and it shows a spirit of independence for you all to whistle different tunes.

Do not loaf about the shops any more than you can help, because it is fatiguing, and you might notice something of a useful nature.

When once you have drawn a line anywhere on your paper never alter it or rub it out, no matter how absurdly wrong it may be, because the use of rubber is very tiring and injurious to the constitution.

Smoke as much tobacco before work hours as possible, because it promotes a peaceful and lazy frame of mind, well suited to long hours of quiet restful meditation on nothing at all.

The Present Circumference of the Earth.

The United States now has 151,000 miles of railroad This, we believe, exceeds the mileage of all the world besides. What a pernicious and vicious thing that tariff must be under which grew up, in a generation, the vast interests that have called for, created and sustains a railroad mileage that would girdle the globe at the Equator *three* times!—*American Manufacturer.*

What Railroad Bonds Pay on the Investment.

Nearly all railroad securities are paying a higher rate of income on the investment in them than they were a year ago, though this is not the case to any appreciable extent in government bonds; as, for instance, the U. S. 4s of 1907 were selling a year ago at 127½, at which price they paid to maturity at the rate of about 2.5/16 per cent. per annum. They are now selling at 126, at which price they pay about 2⅝ per cent. to maturity. British consols also, which a year ago were 100⅝, are now 103 1/16, at which price they pay 2.5/8 per cent. These prices do not indicate any advance in the rates of interest on the most conservative class of investments. Neither has there been much if any change in the prices of the leading standard railroad bonds, which pay on an average about 4¼ per cent. on the investment to the maturity of the bonds, such as the following:

	Years to run to maturity.	Present market prices.	Income on present price.	Income to maturity
Burlington & Quincy 7s	15	130½	5⅜	4¼
Rock Island 6s	29	131	4½	4⅛
St. Paul 1st 7s	14	126	5½	4½
Northwest con. 7s	27	139½	5	4⅜
Northwest gold 7s	14	129	5⅜	4⅜
Del. Lack. & Western 7s	19	133	5¼	4⅛
Louisville & Nashville con. 7s	10	121½	5¾	4⅜
Harlem 1st 7s	12	129	5⅜	4

But the much larger class of bonds which are not so well known have nearly all declined, many of them from 5 to 15 per cent. While, of course, there are some of these which are depressed in consequence of doubts about the continuance of the payments of the interest, as in the case of the Missouri, Kansas & Texas bonds, which have declined simply because the public have not faith in the present management, there are others which pay from 5½ to 6¼ per cent., about which there is no reasonable cause for doubt.—*N. Y. Evening Post.*

A Postal Telegraph Under the Law of 1866.

The Chicago Postal Telegraph Company, an Illinois corporation, which obtained a charter a month ago at Springfield, has, it is announced to-day, given notice to the Federal authorities at Washington of its acceptance of the conditions of the law in relation to telegraph companies passed July 24, 1866. By the terms of the law the company, in consideration of allowing Government dispatches priority over all others and sending them at a rate to be fixed by the Postmaster-General, is permitted to build and operate lines along any post road; in other words, any railroad over which United States mail is carried. The company will co-operate with the Mackey-Bennett system, and has selected a route from Chicago through Milwaukee, Green Bay and Marquette to Duluth, where it connects with the Mackey Bennett, which comes to Chicago via Minneapolis and St. Paul. A branch through Michigan from Marquette has been projected, its construction to be followed by the building of lines west across Illinois and Iowa, and thence west to San Francico via the Union Pacific. The company is entitled by the law of 1866 to receive forty acres of public land for every fifteen miles of telegraph constructed. The treasurer of the company is Mr. Miller, of the United States Distilling Company, of which he is part owner.

Not Provided for in the Uniform Code.

A passenger on the Franklin narrow gauge road relates the following: "On the run from Rocky Mount to Danville several ducks which were confined in the express car took flight out of the door. The train was immediately stopped and brakeman and conductor took to the woods in hot pursuit. The birds were finally captured and placed once more in the care of the expressman, and the train moved on merrily."—*Lynchburg Virginian.*

The Haverhill Accident.

Two cars of a northbound express train on the Boston & Maine were derailed near Haverhill, Mass., about 2 p. m., Jan. 10, by some obscure cause, probably either a broken wheel or a broken switch rod. The train was running about 20 miles an hour on a curve approaching the bridge across the Merrimac River, when the fourth and fifth cars jumped the track and crashed into a tank-house. The tank and its supports were broken and fell upon the cars, crushing them. Two section men eating their lunch in the building, together with seven passengers, were killed and 13 passengers were injured, two of whom afterwards died. The forward portion of the train was stopped by the automatic action of the brake just in time to prevent its either going into the river or against the bridge truss, the third car from the engine having been derailed. None of the cars took fire. One account says this was because they "were heated by steam;" another says the Baker heater was in use.

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Meetings of the stockholders of railroad companies will be held as follows:

West Virginia & Pittsburgh, annual meeting, at the office, Baltimore, Jan. 24.

Railroad and Technical Conventions.

Meetings and conventions of railroad associations and technical societies will be held as follows:

The *Western Society of Engineers* holds its regular meetings at its hall, No. 15 Washington street, Chicago, at 7:30 p. m., on the first Tuesday of each month.

The *New England Railway Club* meets at its rooms in the Boston & Albany passenger station, Boston, on the second Wednesday of each month.

The *Boston Society of Civil Engineers* holds its regular monthly meetings at its rooms in the Boston & Albany station, Boston, at 7:30 p. m. on the third Wednesday of each month.

The *New York Railroad Club* meets at its rooms, 113 Liberty street, New York City, on the third Thursday of each month.

The Western Railway Club meets in Chicago the third Wednesday in each month.

The *Engineers' Club of St. Louis* meets the first and third Wednesday of each month till June.

The *Central Railway Club* meets at the Tifft House, Buffalo, the fourth Wednesday of January, March, May, August and October.

The *General Time Convention*, spring meeting, will be held in New York, April 11.

The *National Association of General Baggage Agents* holds its seventh annual convention at the Grand Pacific Hotel, Chicago, Jan. 18.

The *National Association of General Passenger and Ticket Agents* holds its annual meeting in St. Augustine, Fla., on March 20.

The *Traveling Passenger Agents' Association* holds its annual meeting in Jacksonville, Fla, on Jan 10.

The *American Society of Civil Engineers* holds meetings on the first and third Wednesday in each month at the House of the Society, 127 East Twenty-third street, New York.

Dividends.

Dividends on the capital stocks of railroad companies have been declared as follows:

Huntington & Broad Top, 1¼ per cent. on preferred stock, payable Jan. 31.

Louisville & Nashville, 2 per cent., payable in stock at par, to stockholders of record Feb. 15.

Mine Hill & Schuylkill Haven, $1.75 per share, payable Jan. 16.

St. Louis & San Francisco, 3½ per cent. on preferred stock, payable Feb. 10.

Canadian Society of Civil Engineers.

The second annual meeting will be held in Molson Hall, McGill College, Montreal, on Jan. 12, 1888, at 8 o'clock. The retiring President, T. C. Keefer, C. M. G., will deliver an address. Half fare rates have been granted over the Grand Trunk, Canadian Pacific and Intercolonial railroads. Full fares will be required to Montreal, and free tickets will be issued for the return journey.

New York Railroad Club.

A meeting of this club will be held Jan. 19, at 7:30 p. m. H. H. Westinghouse, of the Westinghouse Air Brake Co., will present the subject of freight train brakes, and will give the results of their recent exhibitions with their freight train air brake. After Mr. Westinghouse's address, the subject of freight train brakes will be opened for discussion.

Railroad Young Men's Christian Association in New York

The 11th anniversary of the Railroad Branch of the Young Men's Christian Association was successfully held in the hall of the Railroad Men's Building in New York, on the evening of Jan. 10. Nearly all the principal officers of the railroads belonging to the Vanderbilt system were present, Cornelius Vanderbilt, the President of the organization, presiding. The latter expressed his satisfaction that the membership had trebled and had risen to 975, at the same time hoping that the increase would continue till all the railroad men, for whose benefit the building had been erected, should become members. Mr. Vanderbilt stated that he should soon appoint a committee to take up and investigate the feasibility of forming a life insurance association, believing that a comprehensive plan might be derived from which great advantage would ensue.

Chauncey M. Depew made one of his peculiar addresses, mingling humor and facts together in his nonpareil style, and gaining the complete sympathy of the assemblage by his compliments, his glowing anticipations and his unique witticisms.

For the rest of January there will be a medical talk for men only, entitled "Purity from a Medical Standpoint," by Dr. C. D. Scudder, on the 16th; a reception to newly appointed committeemen of the Railroad Branch on the 17th; a medical talk for men only, entitled "The Lungs and Throat and the Care of Them," on the 23d; a concert on the 26th; and the members' monthly reception on the 28th. There are regular classes of mechanical drafting on Mondays; phonography, Tuesdays; penmanship, Wednesdays; vocal music, Fridays, and gymnasium on each day of the week. On Sundays there are religious meetings at three different hours, and there is also a bible study on Thursdays.

American Society of Civil Engineers.

The annual meeting of the Society will be held Jan. 18 and 19, 1888, at the Society House.

Wednesday, Jan. 18—The meeting will open at 10 o'clock, and will continue through the day. Lunch will be served at the Society House at 13:30 o'clock.

During the meeting the annual reports will be presented; officers for the ensuing year elected; the awards of the Norman medal and of the Rowland prize for the past year announced; the place for the next convention considered; proposed amendments to the constitution discussed; reports from various committees presented and discussed; technical subjects discussed; general business transacted.

In the evening a paper on the Panama Canal in 1887, by Lieut. C. C. Rogers, U. S. N., will be read by the author and discussed.

Thursday, Jan. 19—The arrangements for this day will be announced in detail at or soon before the meeting. They will include a visit to the bridge in progress of construction across the Harlem Valley (two steel arches of 510 ft. span each and 7 granite arches in approaches).

In the evening a reception for gentlemen will be held at the House of the Society, and at 21:30 o'clock supper will be served.

WILLIAM G. HAMILTON,
CHARLES W. HUNT,
JOHN BOGART,
} Committee.

Western Railway Club.

The next meeting of this club will be held in the Grand Pacific Hotel, Chicago, Jan. 18, at 2 p. m. The subjects for consideration are:

1st. Report of Committee on Axle and Bearing for a 60-000-lb. car. To be submitted by Mr. B. K. Verbryck, Chicago, Rock Island & Pacific.

2d. "Waters for Locomotive Use, effects of different impunities on formation of incrustation, foaming and corrosion. Also practice in washing out boilers." A paper on this subject will be read by Mr. George Gibbs, Chicago, Milwaukee & St. Paul.

3d. "Effect of Magnetism on Watches." A paper on this subject will be read by Mr. E. M. Herr, Chicago, Burlington & Quincy.

PERSONAL.

—William H. Ijams has resigned the position of Secretary of the Baltimore & Ohio.

—Edward Bruestlein, formerly of New York, is now Engineer-in-Charge of the Birsigthal road in Switzerland.

—Mrs. Sarah L. Wason, widow of Thomas W. Wason, founder of the Wason Car Works, died in Springfield, Mass., last week.

—The office of Mr. M. J. Becker, Chief Engineer Pennsylvania Co., Southwestern System, has been removed from Columbus, Ohio, to Pittsburgh, Pa.

—Frederick Mercur, General Superintendent of the Lehigh Valley Coal Co.'s interests in the Wyoming, Mahanoy and Snowshoe regions, died at Wilkesbarre, Pa., on Jan. 11, of typhoid fever. Twenty years ago Mr. Mercur was chief of the engineering and construction department of the Lehigh Valley Railroad Co., and built its line from Penn Haven to Wilkesbarre. In 1867 he became General Superintendent of the Lehigh Valley Coal Co.

ELECTIONS AND APPOINTMENTS.

Baltimore & Ohio.—Andrew Anderson has been appointed Secretary. M. V. Richards has been appointed Land and Immigration Agent, headquarters at Baltimore.

Chesapeake & Ohio.—W. M. S. Dunn has been appointed Consulting Engineer, with office at Richmond, Va.

Chicago, Rock Island & Pacific.—William Brown has been

appointed General Agent at Salt Lake City, vice J. B. Collins.

Chicago & South Side Rapid Transit.—The incorporators of this Illinois company are: W. H. Clark, Charles S. Babcock, August Voughlan, John H. Glade and Charles W. Rigdon.

Chicago & West Michigan.—J. J. McVean has been appointed Chief Engineer, with headquarters at Grand Rapids, Mich. J. W. Petheram has been appointed Lumber Agent, with headquarters at Grand Rapids.

Cresson, Clearfield County & New York Short Route.—The following directors and officers were elected this week: Directors, Jas. S. Atterbury, John H. Boyts, John S. Silver, Charles E. Pugh, P. J. Urling, W. A. Stone, Hon. E. Scull, E. F. Earle, B. F. Boyts, A. Morrow, John S. Blaine, T. H. Givin, J. M. Reid. Officers: Jas. S. Atterbury, President; John H. Boyts, Vice-President and General Manager; M. Kaufman, Superintendent.

Croton Valley—The following officers and directors were elected this week: President, Charles A. Jackson: Vice-President, J. Wheeler Hardley; Secretary and Treasurer, Charles C. Lee; Directors, Charles C. Lee, Charles A. Jackson, James S. Cushman, John L. Logan, Theodore A. Strange, John C. Coleman, William G. Davies, Gilbert M Speir, Jr., Cecil Campbell Higgins, Charles C. Edey, Louis D. Beck, J. Wheeler Hardley, Charles E. Copeland.

Columbus, Hocking Valley & Toledo.—The following directors were elected this week: Charles Crocker, H. L. Terrell, John Newell, Jay O. Moss, D. W. Caldwell, John W. Shaw, William P. Shaw.

Dayton, Fort Wayne & Chicago.—The following board of directors has been elected: F. B. Loomis, W. C. Boone, T. C. Doremus, George Hoadly, and Christopher Meyer, all of New York; John C. Coombs, Boston; F. H. Short, Cincinnati; R. D. Marshall, J. E. Gimperting and J. O. Arnold, of Dayton, O.; H. B. Morehead, Cincinnati; M. C. Allison, Xenia, and George E. Pomeroy, Toledo.

Denison & Sherman.—The incorporators of this Texas company are: J. T. Munson, Edward Perry, M. H. Koffin, M. Ford, E. H. Linge, Sam Hanna, A. R. Collins, Paul Waples, J. B. McDougall, Sam Starr, John C. Carr, J. C. Field, A. F. Platter, W. B. Munson.

Denison & Washita Valley.—The meeting at Denison, Tex., last week resulted as follows: John Scullin, St. Louis, President; Ed. Perry, Vice-President; J. T. Munson, Treasurer; H. T. V. Perry, Secretary; Sam Hanna, J. B. McDougall, A. F. Platter, Sam Starr, J. C. Field and A. R. Collins, board of directors.

Georgia Terminal.—The incorporators are E. P. Howell, S. M. Inman, Henry Jackson, Alfred Sully, Thomas Smith, Isaac L. Rice, John A. Rutherford, Emanuel Lehman, Calvin S. Brice, Samuel Thomas, John H. Inman, George S. Scott, T. M. Logan, Pope Barrow and James White.

Indianapolis, Decatur & Western.—At the meeting this week H. B. Hammond was elected President and T. B. Atkins Secretary and Treasurer.

Kansas City, Arkansas & New Orleans.—The directors of this new Arkansas company are: George M. Barbour, G. D. Foster and Edmund Lehman, of Beebe, Ark., and J. Fleissman and A. Cudell, of Chicago.

Keokuk & Des Moines.—The office of Assistant Superintendent Coombs has been transferred from Des Moines, Ia., to Oskaloosa, from which point the dispatching of this and the Washington Division of the Rock Island will be conducted. J. C. Coombs has his authority extended over the Knoxville and Oskaloosa divisions.

Kings County Elevated.—The following directors were elected this week: General James Jourdan, Wendell Goodwin, Edward A. Abbott, James O. Sheldon, Samuel Thorne, Harvey Farrington, William A. Read, S. Newton Smith, Henry J. Robinson, General Q. A. Gilmore, President of the company, refused re-election to the directory on account of ill-health.

Lake Shore & Michigan Southern.—George W. Andrews has been appointed Traveling Passenger Agent, with headquarters at Kansas City.

Livingston & Castle Mountain.—The incorporators of this Montana company are: S. T. Hansen, of Helena; A. L. Lowe, J. A. Savage, F. D Pease and E. Goughnour.

Louisville & Nashville.—J. C. Loomis has been appointed Superintendent of the Louisville, Cincinnati & Lexington Division, vice C. R. Barnhart, assigned to other duties.

C. H. Fitzgerald has been appointed Traveling Passenger Agent, with headquarters at Kansas City, Mo., vice T. W. Kittle, resigned.

Minneapolis & St. Louis.—R. G. Brown has been appointed Auditor, to succeed T. J. Hyman, resigned.

New York Elevated.—The stockholders voted this week to issue $15,000,000 bonds with which to take up outstanding bonds, purchase real estate and rolling stock, and construct new lines. Russell Sage voted the 63,937 shares held by the Manhattan Company in favor of the issue of the bonds. This latter vote was vigorously opposed, and the matter will probably be taken into court.

New York, Ontario & Western.—Charles H. Smith has been appointed Assistant Engineer. Office at Middletown, N. Y.

New York, Pennsylvania & Ohio.—H. T. Thompson, General Roadmaster of the Mahoning Division, has been appointed Engineer in charge of the building of the second track of that division, which will be laid at once. A. Mordecai has been appointed Acting General Roadmaster.

Norwich & Worcester.—The following directors were elected this week: Edward L. Davis, Thomas B. Eaton, Samuel Woodward, Josiah H. Clark and Francis H. Dewey, of Worcester; William Bayard Cutting, of New York, Lorenzo Blackstone and William A. Slater, of Norwich, and George H. Ball, of Boston.

Ohio & Northwestern.—Hon. Geo. West, of New York, has been elected President of this company to succeed H. C. Parsons, resigned.

Paris & Great Northern.—At a meeting of directors in Paris, Tex., last week, the following officers were elected: Jno. O. Day, of Springfield, Mo., President; S. J. Wright, of Paris, Tex., Vice-President; Jno. Martin, of Paris, Tex., Treasurer; Alexander Douglass, of St. Louis, Secretary; B K. Baldwin, of Paris, Tex., Assistant.

Pueblo, Union Depot & Railroad.—The incorporators of this Colorado company are David H. Moffatt, Walter E. Cheeseman, A. S. Hughes, P. J. Flynn and C. F. Weeks, of Denver.

Philadelphia & Reading.—At the annual meeting this week the election resulted as follows: President, Austin Corbin; Managers, A. J. Antelo, Semuel R. Shapley, Thomas Cochran, George De B. Keim, Stephen A. Caldwell and George Baer; Treasurer, William A. Church; Secretary, William R. Taylor.

The newly elected board of managers met in Philadelphia this week and elected officers as follows: Vice-President and General Manager, A. A. McLeod; Secretary, William R. Taylor; Registrar of the General Mortgages, Albert Foster; Registrar of the Preferred Mortgages, John Walker, Jr.; Assistant Secretary, Charles H. Quarles.

Pittsburgh & Lake Erie.—At the annual meeting this week the election resulted as follows: President, John Newell; directors, Cornelius Vanderbilt, William K. Vanderbilt, Hamilton McK. Twombly, David Hostetter, James I. Bennett, M. W. Watson, James M. Bailey, Herbert Dupuy, A. F. W. Painter, James M. Schoonmaker, Henry Hice, D. Leet Wilson.

Pittsburgh, McKeesport & Youghiogheny.—The election this week resulted as follows: President, D. Hostetter; directors, Cornelius Vanderbilt, William K. Vanderbilt, Hamilton McK. Twombley, James Tillinghast, John Newell, J. H. Reed, James I. Bennett, M. W. Watson, and Henry Hice.

Richmond & Danville.—W. G. Oakman has been elected Second Vice President.

St. Augustine & Palatka.—W. C. Chambers has been appointed Auditor, with office at St. Augustine.

St. Louis, Vandalia & Terre Haute.—The election in Indianapolis this week resulted as follows: Directors, Thomas D. Messler, J. N. McCullough and William Thaw, of Pittsburgh; W. R. McKeen, of Terre Haute; R. L. Dulaney, E. O. Stanard, A. G. Henry, Charles H. Seyft and J. S. Speers. The officers chosen by the directors were: Thomas D. Messler, President; John E. Davidson, Treasurer; S. B. Liggett, Secretary, and C. D. Holtes, Assistant Secretary.

San Antonio & Aransas Pass.—B. F. Yocum has been appointed General Manager.

Santa Ana, Fairview & Pacific.—The directors of this new California company are: A. L. Clark, E. L. Buck, I. W. Gardner, A. L. Moye, W. A. Coles, P. R. More and J. G. McMichael.

Syracuse & Baldwinsville.—The following directors were elected this week: Frank C. Hollins, John T. Skinner, D. M. Henderson, W. W. Downer, S. K. Greene, W. F. Morris, J. C. Morris, James Frazee, Jacob Amos, A. T. Hotaling, D. L. Wing, W. R. Lamberton and R. W. Johnson. The following officers were elected by the board: President, Frank C. Hollins; Vice-President and General Manager, John T. Skinner; Secretary, W. W. Downer, and Treasurer, D. M. Henderson.

Toledo, St. Louis & Kansas City.—C. N. Pratt has been appointed Master of Transportation, with headquarters at Frankfort, Ind.

Verdigris Valley, Independence & Western.—At the annual election in Independence, Kan., recently the following directors were elected: Geo. J. Gould, David Kelso, John McCullagh, A. C. Stich, E. G. Merriam. The new board elected the following officers: Geo. J. Gould, President; David Kelso, Vice-President; Geo. C. Smith, Secretary; A. H. Calif, Treasurer; John McCullagh, Assistant Secretary and Assistant Treasurer.

Wheeling, Pittsburgh & Baltimore.—The following officers and directors were elected this week: J. B. Washington, President, vice Thomas King, resigned; A. W. Black, Secretary; W. H. Ijams, Treasurer. Directors: J. B. Washington, Pittsburgh; Samuel Spencer, Baltimore; John McCleave, Pittsburgh; J. V. Patton, Pittsburgh; J. D. Scully, Pittsburgh; W. W. Smith, Washington; and William Workman, Washington.

Zanesville, Mt. Vernon & Marion.—The election last week resulted as follows: Directors: Gideon E. Meigs, Abner P. Pinkerton, Henry D. Lee, David Mackey, Henry Cassell, Allen Levering, Harry True, William Banning, W. Hadley Clark, Henry C. Werner, Frank N. Wedge, Rufus C. Burton, Jason J. Cover, N. H. Tilton, Nehemiah Tilton; Gideon E. Meigs, President; Abner P. Pinkerton, Henry D. Lee and Henry Cassell, Vice-Presidents; Frank N. Wedge, Treasurer; Rufus C. Burton, Secretary; Albert E. Boone, General Manager; B. E. Cutler, Chief Engineer; H. A. Leslie, Auditor; G. F. Axline, Assistant Treasurer.

OLD AND NEW ROADS.

Annapolis & Baltimore Short Line.—The company will build a cut-off near Baltimore from Clifford's to Carroll switch.

Atchison, Topeka & Santa Fe.—The company has just opened two additional divisions in California, one from Santa Ana to San Juan-by-the-Sea and the other from Oceanside to Escondido, the latter branch having just been finished.

Athens & Tellico.—McDonald, Shea & Co., of Knoxville, Tenn., have received the contract for grading 20 miles, and for cross ties, tracklaying and bridging of the entire 25 miles of this road in Tennessee. Five miles of grading that was formerly let is now about completed.

Atlantic & Blue Ridge.—Work will be commenced on this road next April. It will extend from Tallulah, Rabun County, Ga., to Maryville, Blount County, Tenn., and will be 130 miles long.

Baltimore, Grafton & Charleston.—A preliminary survey of this road has been made from the mouth of the Buckhannon River to the town of Buckhannon, in Upshur County, W. Va., a distance of about 15 miles. A narrow gauge road from Grafton to a point on the Buckhannon River, about 30 miles, operated by the Grafton to Greenbrier, will be changed to standard gauge and used as part of the route, which will be extended to Charleston. The line will be located in January, and the road will be pushed through to Buckhannon this winter.

Bay City & Battle Creek.—It is proposed to build a road between Bay City and Battle Creek, Mich., via Ionia, Midland, Nashville and Alma. It is proposed to raise $65,000 at once. A. W. Wright, of Alma, George E. Howes, of Battle Creek, and Wm. Riardon, of Midland, are interested.

Blackville, Alston & Newberry.—At a meeting in Charleston, S. C., recently the directors decided to ask for bids for grading the road from Sallyville to the Kaolin mine. J. H. Averill is Superintendent.

Bristol & South Atlantic.—This company has obtained a charter in Bristol, Va.

Buffalo, New York & Philadelphia.—The Receiver has submitted the following report of the operations of this company for the year ending Sept. 30 to the state Railroad Commissioners: Gross earnings, $2,716,388; increase, $117,819; operating expenses, $2,231,336; increase, $182,494; net earnings, $485,052; decrease, $64,675; other income, $12,180; decrease, $13,220; gross income, $497,232; decrease, $77,995; fixed charges, $235,912; decrease, $1,538,324; net income, $261,319, against deficit in 1886 of $1,199,009; sundry payment for legal expenses and taxes of previous years in dispute, also worthless accounts charged off, together with deficit of 1886, $2,367,329; total deficit Sept. 30, 1887, $2,106,010, against $2,364,856 deficit in 1886.

Burlington, Cedar Rapids & Northern.—The company has contracted for a new bridge to be built at Sioux Falls, Ia., at a cost of $40,000.

Carolina, Knoxville & Western.—The contract for building the road from Knoxville to Greenville, Tenn., has been awarded to the Sibley Construction Co., work to begin Jan. 15.

Central of New Jersey.—Receivers John S. Kennedy and Joseph S. Harris have filed their final report to the U. S. Circuit Court of New Jersey, having operated the road for the year 1887. All interest in default, and all floating debt have been paid; the fixed charges have been reduced, by the execution of the plan of reorganization, by the sum of $335,000 per annum, which in the opinion of the Receivers secures the future solvency of the company. The following table shows the extent to which the bonded debt has been exchanged and provided for by new general mortgage bonds under the plan of reorganization:

Names of securities.	Total issue.	Deposited under plan or provided for	Balance subject to former interest charges.
Convertible bonds	$4,400,000	$3,104,000	$1,296,000
Consolidated mortgage bonds	15,000,000	10,940,000	4,060,000
Adjustment mortgage bonds	5,254,000	5,254,000	.....
Debenture bonds	3,264,000	2,484,200	779,800
Newark & New York bonds	600,000	600,000	.....

The gross receipts from the operation of the property for ten months were	$9,597,421
Same period, 1886	8,779,528
Increase	$817,893

Operating Expenses.

1887 (10 months)	5,077,559
1886 "	5,055,215
Increase	$22,344

Net Receipts.

1887 (10 months)	$4,519,862
1886 "	3,724,314
Increase	$795,548

The amounts expended by the Receivers from Jan. 1 to Dec. 1, 1887, aggregated $2,452,393, the principal items having been: Renewals, betterments and extensions, $266,171; state and local taxes prior to 1887, $566,053; Receiver Little's indebtedness and loans, $860,000; Central of New Jersey car trust certificates, $139,000; and assessments on securities deposited under the Reading reorganization plan, $300,000. Under the lease of May 29, 1885, the roads comprising the Central of New Jersey system were operated by the Receivers of the Reading, although default had been made on payment of rental. A decree was obtained by the Central Co. authorizing it to terminate the lease, but this authority was not exercised until certain necessary arrangements had been effected.

On Jan. 1, 1887, all the roads and property of the system were delivered up by the Receivers of the Reading to the Receivers of the Central. At the time of the Receivers' appointment an accounting was in progress between the Reading and the Central, under decree of Court, which presented serious questions of law and fact. This controversy not only involved very large amounts—the claim of the Central being that the Reading was indebted to it upwards of $3,850,851, and the claim of the Reading being, on the other hand, that the Central was indebted to it in the sum of $1,385,723 in cash and $3,000,000 in bonds—but its pendency was a serious obstacle to the reorganization of either company.

Under this agreement the Central received for its claim against the Philadelphia & Reading and its Receivers the following amounts, viz:

Betterments on Central lines made by Reading Co. and its Receivers, as claimed by them	$299,271
Construction account of the Lehigh Coal & Navigation Co., and claims against other companies assigned to Central	297,982
Credit of amount realized by sale of $1,000,000 first series 5 per cent. Reading bonds	578,877
$2,000,000 second series 5 per cent. Reading bonds with coupons of August, 1883, and February, 1884, at par	2,100,000
Supplies and claims of Reading against New York & Long Branch, assigned to Central	654,427
Unsecured claims against Reading admitted to reorganization, subject to payment of assessment	236,512

Chattanooga, Rome & Columbus.—The first six miles of this road from Chattanooga will be completed in 10 days. It is expected that the grading of the first 26 miles will be finished and ready for the rails within six weeks.

It is stated that the company has decided to build its road via Tallapoosa, Ala., with a branch to Carrollton.

Chicago, Jefferson City, Girard & El Paso.—A preliminary survey of this road between Girard, Kan., and Jefferson City, Mo., has been completed. The grades do not exceed 60 ft. $100,000 in cash and land has been donated by the people along the route and $300,000 more has been promised.

Chicago, Kansas & Nebraska.—The road was finished this week from the Indian Territory across Red River into Texas and connected with the line surveyed for the Wichita Falls & Winfield road.

A survey will be made for a line from Abilene, Tex., to Wichita Falls via Albany.

Chicago, Santa Fe & California.—The company has recorded a resolution of the directors to issue $729,540 of 6 per cent. bonds on the Pekin Division, exclusive of the rolling stock, to raise funds for finishing division.

The last rail was laid last week. Trains will be run over the entire line as soon as the Missouri River bridge is completed, which it is expected will be about Jan. 10.

Chicago & South Side Rapid Transit.—Articles of incorporation filed in Illinois. The object is to build an elevated road in Chicago. Capital stock, $7,500,000.

Delaware Bay & Cape May.—This road has been sold to a syndicate. It extends from Cape May City to Cape May Landing, N. J., 8 miles.

Denison & Sherman.—Charter filed in Texas. Capital stock, $100,000.

Denison & Southwestern.—Charter filed in Texas. The purpose is to build a road from Denison southwestward to Abilene, via South Mayde, Pilot Point, Decatur, Graham and Albany.

Denison & Washita Valley.—At the annual meeting in Denison, Tex., last week, the capital stock of the company was increased to $2,000,000. Bonds were authorized to be issued not to exceed $18,000 a mile. Surveyors are now at work north of the Red River in the Indian Territory working toward the coal fields, and construction work will begin within a month or so. The road was completed to the Red River last week and the first train was run there from Denison.

Eutawville.—The contract for building the bridge across the Santee River and the trestling through the Santee swamp has been let to S. J. Pregnall, of Eutawville, S. C. Contracts for grading the road will soon be let.

Georgia Pacific.—The preliminary survey for this road has reached Greenwood, Le Flore Co., Miss. The locating engineers are 10 miles east of Greenwood and will reach there the 15th.

Georgia Terminal.—The company has obtained a charter in Georgia to construct a belt line around Atlanta and to build a union passenger station Capital stock, $1,000,000.

Hudson's Bay.—It is said the company, being dissatisfied with the report of Lieut. Gordon, on the navigability of Hudson's Bay and Straits as an outlet for the products of the Northwest, has offered to furnish the Dominion Government with a vessel for another expedition to the bay, the Government to defray the expenses of the trip. It is understood the offer will be accepted. The intention of the company is that the vessel should winter in the bay, to show at how late a period navigation closes and how early it opens in the spring.

H. S. Hoyt, of New York, has gone to Manitoba to take possession of this road till his claim for contract work is settled. Mr. Hoyt says that he will not undertake to operate the road, and that he thinks no one else will at present. Eventually it may be extended to Grand Rapids, the head of navigation on Lake Winnipeg, but it is very unlikely that it will ever be built to Hudson's Bay.

International & Great Northern.—Attorney-General Hogg, of Texas, has filed a petition asking that the charter of this company be revoked. It is charged that the company has wilfully and negligently refused to comply with the requirements of the charter in regard to keeping the road in proper condition and in providing for the comfort of its patrons. He also charges that it has abandoned 270 miles of its track to the use of the Missouri Pacific and the Missouri, Kansas & Texas. That by an agreement, the terms of which are unknown to the state, the respondent company's road has been leased and is unlawfully operated by these two companies, and that the respondent company is now without any bona fide managing officers in Texas, the Missouri Pacific officers managing the respondent's road. And so, having violated the laws of Texas, the Attorney-General informs the Court that the International & Great Northern has no longer the right to own or operate a road, and demands a forfeiture of its franchises and charter. A decree is asked for in addition, ousting the officers of the company, and that each of them, when their names are discovered, shall be fined $5,000 for having forsaken their trusts and obligations to the public.

Jacksonville Southeastern.—There are now fifteen damage suits against this company in the city of Centralia, Ill., brought by property owners along the line of road. The aggregate amount of damages sued for is $161,600.

Kansas City, Arkansas & New Orleans.—Articles of incorporation have been filed in Arkansas with the object of building a road from a point near Beebe, Ark., to Monroe, La., 200 miles, running through the counties of White, Prairie, Lonoke, Arkansas, Desha, Lincoln, Drew and Ashley, in Arkansas, and the parishes of Morehead and Ouichita, in Louisiana, with a branch from the main line at Monticello, Drew County, running northward through Drew, Lincoln, Jefferson and Lonoke counties, a distance of 85 miles. Capital stock, $5,000,000.

Lawrence, Atchison & Southern.—The survey of this road between Atchison and Lawrence, Kan., has been completed and will be continued southward to the Indian Territory via Pomona. Work will be commenced immediately.

Lehigh Valley.—The engineer corps of this company is surveying a route into Scranton, Pa. It is rumored that the line will be run from Pittston Junction through Keyser Valley and the mining towns of Barbertown, Pyne, Archbald, Taylorport and Feltzville to Scranton. The line will traverse a rich anthracite district. The Pennsylvania is said to be interested in the route.

Little Rock & Hot Springs.—Articles of incorporation have been filed in Arkansas for the purpose of building a road from Little Rock to Hot Springs. Capital stock, $500,000. R. A. Edgerton and others are the incorporators.

Lincoln, Red Oak & Des Moines.—Efforts are being made by the Board of Trade of Creston, Ia., to have this road extended to that city.

Livingston & Castle Mountain.—Incorporated in Montana for the purpose of building a road from Livingston northward to Shields River Valley, thence to near the headwaters of the Musselshell and then northward into the Castle Mountains mining district. Capital stock, $1,000,000.

Louisville & Nashville.—Acting upon a petition from the English stockholders of the company, the directors this week voted to declare a scrip dividend of 2 per cent. on the outstanding capital stock. The petition suggested that the direction pursue a policy consisting in applying to construction purposes for a period of three years from the commencement of the present fiscal year such surplus as would be available for the payment of dividends, and, instead of paying the same to the shareholders in cash, issuing to them at par shares in the company for the amount to which they are fairly and properly entitled.

Lowell & Hastings.—This road is building south from Lowell, Kent Co., Mich. It is expected to have trains running into Hastings by May 1. From Hastings the road will probably be continued south to Battle Creek

Marietta & North Georgia.—The company has contracted with the Scranton (Pa.) Steel Works for 10,000 tons of 63-pound steel rails.

Mexican International.—The road has been completed to Villa Lerdo, in the Laguna country, on the Mexican Central, thus closing the gap between Villa Lerdo and Eagle Pass, the American terminus, which is on the Rio Grande, about 500 miles southeast of El Paso. This completes the second all-rail route to the interior of Mexico, and shortens the distance from the Texas border over 200 miles, as against the El Paso route, while the total shortening of the distance from the interior of Mexico to the east, via New Orleans, is about 700 miles. The International Line is part of the Southern Pacific system; it traverses extensive coal fields near the Sabinas River, and its chief traffic will be the carrying of coal to the Mexican Central for distribution to the cities on the line of the latter.

Mexican National.—Over 4,000 men are now at work between Saltillo, the southern terminus, and San Miguel, in the state of Guanajuato, the northern terminus of the road, north of the City of Mexico. Work was originally begun at both ends and pushed about 200 miles each way, when the money gave out. Engineers who have just come up from Saltillo to Galveston, state that the road is now graded for a distance of 80 miles south of Saltillo, and tracklaying is progressing at the rate of two miles per day. From San Miguel the work has been pushed until the grade is nearly completed to the famous city of San Luis Potosi. The grading parties will meet about the 1st of July. Steel rails will be laid the entire distance, and trains will be running through to the City of Mexico by Sept. 1. There are a great many tunnels, as the line pierces the Sierra Madre Mountains. The distance from Laredo to the City of Mexico will be less than 850 miles, against 1,200 miles from Eagle Pass by the new International route, and 1,225 miles from El Paso over the Central. The distance from St. Louis to the City of Mexico will be shortened by about 800 miles, as compared with the Mexican Central route, and over 200 miles as against the International, while the shortening from Boston and New York via the Atlantic coast roads into Texas en route to the city of Mexico will approximate fully 1,000 miles, as against the present long distance. With the completion of the Mexican National, the three great Southwestern systems, the Gould system, the Southern Pacific, and Atchison, Topeka & Santa Fe will each have an independent and direct connection with the city of Mexico, via Laredo, Eagle Pass and El Paso. It is said that a grand excursion to the city of Mexico, somewhat similar to the famous Northern Pacific celebration, will take place early next fall.

Missouri Pacific.—The company has made a contract to guarantee the bonds and take each 10 miles of road, as it is completed by a company that has organized in Wichita and Winfield, Kan., with the purpose of building a line between those cities, a distance of 47 miles. The projectors of the road are William Mathewson, N. A. English and others, of Winfield and Wichita.

New Haven & Derby.—The company failed to secure the necessary land for the proposed terminal improvements in New Haven, Conn., at a reasonable figure, and has served notices on about 40 property holders to appear before the commissioners, and show cause why their land should not be condemned. The company also wants three cross streets closed so as to avoid grade crossings. An organized opposition will be made to this by the property owners, and there is a prospect of considerable litigation.

New Roads.—It is said that a road will be built from Colton, San Bernardino County, Cal., to Riverside, continuing southeast till it reaches the Pomona & Elsinore, near South Riverside and south of the Santa Ana River.

New York, Lake Erie & Western.—The company is asking bids for 1,000 gondola and 500 box cars.

New York, Ontario & Western.—A new contract between this company and the New York Central & Hudson River, superseding the contract of Jan. 1, 1886, has been submitted to the directors of the former company. The directors have voted to confirm it and at the annual meeting next week the stockholders will probably do likewise, as it is considered very favorable to the New York, Ontario & Western. The last complication of the latter company in connection with its Weehawken terminals is disposed of by payment of the claim of the Continental Bank, by which $105,000 of the company's first mortgage bonds are now tied up as collateral. There is also to be a payment to the Ontario company of $148,000, half in cash and half to be credited to trackage and terminal charges during the coming four years. Then there is a modification of the basis on which train mileage is to be based after 1895, so that from that time the Ontario company will pay for the use of the road south of Cornwall the proportion of the cost of maintenance that the mileage of trains shall bear to the entire train mileage on that portion of the road, and the same proportion of the interest, at 4 per cent. per annum on $2,000,000 (in place of $5,000,000, as provided in the original agreement), and on such sums as may be actually expended for necessary improvements after January, 1886. A traffic arrangement with the Wallkill Valley road and an agreement for exchange of traffic with the New Jersey Junction road (controlled by the New York Central) will be considered with this contract at next week's meeting of stockholders. President Fowler has the proxies of much more than a majority of shareholders to vote in favor of the contract.

New York & New England.—It is expected that this company will build a branch from South Manchester, Conn., via Glastonbury to Gildersleeves, connecting there with a new line of propellers to be established between Cromwell and New York.

Northeastern (Georgia).—The Richmond & Danville, which controlled this road by virtue of the operating agreement of June 14, 1886, has delivered that portion of it between Cornelia and Tallulah Falls, Ga., to W. B. Thomas, of Tallulah Falls, in compliance with a resolution adopted by the directors of the Northeastern at a recent meeting.

Northern Maine.—The survey for this road has been completed to Crystal, Aroostook Co., 29 miles from Houlton. About 5 miles to Patten, Penobscot Co., remain to be surveyed, but this will not be done till spring. The road was chartered in May, 1887.

Oxford & Clarksville.—This North Carolina road is completed from Oxford to Sassafras Fork, a distance of 10 miles, and is being built at the rate of a mile a day.

Paris & Great Northern.—This is the Texas end of the St. Louis & San Francisco, from Red River to Paris. It is to be extended immediately to a connection with the Houston & Texas Central at Roberts.

Pennsylvania.—The last legal obstruction to the elevation of this company's tracks in Jersey City has been removed. Vice-Chancellor Van Fleet has refused to grant the injunction asked for by the property owners who sought to restrain the company from prosecuting the work.

Peoria, Decatur & Evansville.—A partly estimated statement of the earnings of this company for the year 1887 is as follows: Gross earnings, $857,967; operating expenses, $425,000; net, $432,967. Payments—Interest first mortgage, $165,420; second mortgage, $104,400; car trusts, $48,000; interest on trusts, $15,000; taxes, $40,000; rental leased lines, $30,000; total payments, $402,820; cash surplus, $30,147.

Pine Bluff, Monroe & New Orleans.—A. C. Barstow, of Providence, R. I., representing this company, has proposed to build the road from Pine Bluff, Ark., to Monroe, La., provided the first named city vote $50,000, to be paid when the road is completed. It is likely that the proposition will be accepted.

Pueblo Union Depot & Railroad Co.—Articles of incorporation filed in Colorado. The object of the company is to build a union passenger depot, and within five miles of the city limits of Pueblo, and construct connecting roads. Capital stock, $150,000.

Rio Grande & Pacific.—Articles of incorporation have been filed under this name for a Utah division of the Denver & Rio Grande road. The line enters Utah at the most eligible point north of the White River Canon, thence westward by the most feasible route to Salt Lake City and Ogden. The capital stock of the new corporation is $8,000,000.

Rio Grande & Utah.—This road will run from Durango, Col., down the Chama River, through the San Juan country, connecting with the Atchison, Topeka & Santa Fe at Algodones or Albuquerque, N. M. Work will commence early in the spring. The company is said to be an entirely independent one, with friendly relations existing between it and the Santa Fe.

Roanoke & Southern.—An election will be held in Winston, N. C., on Feb. 18, to decide whether $100,000 shall be issued in bonds to aid in the building of this road. The road is projected to run from Roanoke, Va., to Atlanta, Ga., a distance of 550 miles. The survey from Roanoke to Salem, N. C., is nearly completed.

St. Louis, Vandalia & Terre Haute.—Judge Gresham has rendered a decision affirming the validity of the lease of this road to the Terre Haute & Indianapolis. The case was brought by the St. Louis, Vandalia & Terre Haute against the other company to declare the lease void. The question involves over $21,600,000.

St. Louis & Western.—A deed has been filed in Sedalia, Mo., conveying the property and franchise of this company by Louis Schmidt, Receiver, to John O'Day, of Springfield, Mo., for a consideration of $30,000. The transfer includes the main line extending from Lebanon, Mo., to Fort Scott, Kan., and six projected branches.

San Pedro, Los Angeles & Utah.—The company is having considerable difficulty in securing the right of way along its proposed route. The property owners are disposed to demand exorbitant prices for their land. A party of engineers are surveying the route north of Pasadena.

San Pete Valley.—This Utah company will build a 25-mile extension from the present terminus of the road at Moroni to Nanti. Grading will begin as soon as the weather will permit. S. Bamberger, of Salt Lake City, is General Manager.

Santa Ana, Fairview & Pacific.—Articles of incorporation filed in California for the purpose of building a road from Santa Ana to a point on the coast near Newport harbor, via the town of Fairview. Capital stock, $60,000.

Shenango & Allegheny.—The sale of this road to John M. Shedd, Trustee for the second mortgage bondholders, subject to liens aggregating $177,026, has been confirmed. The amount paid for the road was $625,000.

Western Railway of Alabama.—About 20 miles of road are still to be built between Marion Junction and Mobile. Recent heavy rains have greatly retarded pregress on the line.

TRAFFIC AND EARNINGS.

The Railroads of the State of New York.

The report of the Railroad Commissioners of the state of New York for the year ending Sept. 30, 1887, gives the following summary of the business of the roads of the state for the year:

A largely increased business was done last year. The total for all roads and the details for each are given with great particularity in the second volume of this report. A few of the grand totals and most important final results are given here as usual:

	1886.	1887.
Gross earnings from operation of road	$125 160,289	$143,724.491
Operating expenses	79,260,798	92,439,975
Net earnings from operation of road	45,899,491	51,284,516
Income from other other sources than operation of road	4,449,392	5,453,671
*Interest paid and accrued	25,673.374	24,937,671
Taxes	4,645.677	5,018,907
Miscellaneous	1.270.270	1,039,697
*Dividends declared	11,178.177	13,822,874
Surplus	4.658,191	8,784,404
Stock and debt	1,224,772,611	1,269,501,238
Cost of road and equipment	1,138.370,471	1,180,585,382
Percentage of gross income to cost of road and equipment	4.42	4 81
Percentage of net income to capital stock	2.60	2.91
Percentage of dividends declared to capital stock	1.83	2.19
Miles of road built in New York state	7,298.19	7,383.28
Tons of freight carried one mile. Inc. in 1887 of 13.65 per cent.	10,640,849,655	12,094,162,719
Average freight earnings per ton per mile (cents)	0.78	0.796
Average freight expenses per ton per mile	0.49	0.514
Average freight profit per ton per mile	0.29	0.282
Passengers carried one mile (exclusive of elevated roads) Inc in 1887 of 09.77 per cent.	1,830,734,634	2,010,016,812
Average earnings per passenger per mile (cents)	2.3	2.36
Average expenses per passenger per mile (cents)	1.4	1.51
Average profit per passenger per mile (cents)	0.9	0.85

NOTE.—By far the greater part of the marked increase in 1887 of stock, debt and cost of road and equipment is due to the fact that the figures as to these items embrace those of the entire "Fitchburg" system against the comparatively small items of the "Boston, Hoosac Tunnel & Western" R. R. and "Troy & Boston" R. R. in 1886 And as the earnings of the said "Fitchburg" road for the *whole year* are included in 1887 against some four to five months of the earnings in 1886 of the two other companies named, no small part of the apparent increase in the volume of business in 1887 is properly attributable to this fact. Just what these proportions amount to can only be arrived at by a careful analysis of the detailed reports of these respective companies, which appear in the second volume of this report.

*Includes respectively interest and dividends paid by lessors from rentals received from lessees as follows:

	1886.	1887
Interest	$6,854,278	$7,468,149
Dividends	3,481,812	3,614,989

Railroad Earnings.

Earnings of railroad lines for various periods are reported as follows:

Month of November:

Canadian Pac....	$1,286,237	$1,073,286	I.	$212,951	19.8
Net....	511,099	448,237	I.	62,862	14.0
Ches., O. & S. W.	200,140	178,983	I.	30,157	17 2
Net....	73,699	77,563	D.	3,864	4.9
Gr. B., W. & St.P.	34,377	36 724	D.	2.347	6.3
Net....	9,450	11 9 5	D.	2,455	20 6
Louis. & Nash...	1,501,890	1,281,.997	I.	219,901	17.1
Net....	626,282	530,858	I.	95.424	17.9
Mex Central....	468,089	379,902	I	88,187	23 2
Net....	205,759	179.529	I.	26,230	14.6
N. Y., Ont. & W.	131,873	108,549	I.	23,324	21.5
Net....	18,486	13,212	I.	5,274	39.9
Ohio & Miss....	337.328	325.654	I.	11,674	3.5
Net....	82,563	103,809	D.	21,246	20.4
Oreg. R. & N. Co	616,057	519,182	I.	96,875	18.6
Net....	358,975	224,793	I.	34,182	59 6
Pensylvania:					
N'west. Sys....	1,167,159	1,382,981	D.	215,822	16.3
Net....	619,267	544,965	I.	74,302	13 6
S'west Sys.....	1,216,501	1,092,250	I.	124 251	11.3
Net....	271,765	257,259	I.	14 506	5.6
Phila. & Erie....	367,724	338.027	I.	29,697	8.7
Net....	142,873	123,983	I.	18,800	15.1
Shenandoah Val.	87,819	71,053	I.	16,766	23.5
Net....	4 963	10.109	D.	5,146	50.9
Tol. & Ohio Cen.	111,227	84,671	I.	26,556	31.3
Net....	48,226	28,512	I.	19,714	69.5
Total (gross) ...	$7,535,429	$6,873,259	I.	$662,170	9.6
Total (net)... ...	2,973,407	2,554,734	I	446,238	....
			D.	27,565	....
Net.....	.....	.....	I.	418,673	16.3

Month of October:

	1887.	1886.	Inc. or dec.		P c.
California South	$124,622	$67,522	I.	$57.100	84 5
Net....	39,561	13,202	I.	26,359	199.6
Central of N. J..	971,048	1,049 806	D.	78,758	7.5
Net....	406 416	474,427	D.	68,011	14.5
Central Pacific..	1.333,101	1,141,081	I.	192 020	16 8
Net....	627,395	601.879	I.	25,516	4.2
Ches. & Ohio....	412,249	372,031	I.	40,818	10 8
Net....	140 430	128,380	I.	12,050	9.3
Southern Pacific:					
Nor. Div. (Cal.)	162,778	170,541	D.	7,763	4.5
Net....	83,274	85.353	D.	2 079	2.4
So. Div. (Cal.)..	492.397	245.110	I.	247,287	100.8
Net....	210,156	68,886	I.	141,290	205.0
Arizona Div....	143 148	127,47	I.	15,676	12.2
Net....	31 024	48.699	D.	17,675	36.2
New Mex. Div..	36,169	50,943	D.	14,824	29.1
Net....	1,923	21,092	D.	19,169	90.8
Tot'l So. Pacific	834 442	594,086	I.	240,576	40.4
Net....	326,377	214,010	I.	112,367	52.5
Total (gross).	$3,675,562	$3,224,506	I.	$451,056	13 9
Total (net)	1,540,179	1,431,898	I.	213,136	....
			D.	104,885	....
Net.....	.....	.....	I.	108,281	7.5

Ten months—Jan. 1 to Oct. 31:

California South.	$1,199,798	$564,032	I.	$635,766	112.7
Net....	506,303	Def. 3,389	I.	503,782	....
Central of N. J..	9,597,422	8,779,529	I.	817,893	9.3
Net....	4,519 863	3,724,314	I.	795,549	21.6
Central Pac	11.190,643	9,940,703	I.	1,249,940	12.3
Net	5,321,396	5,257,988	I.	63 408	1.2
Ches. & Ohio.....	3,687,228	3,397,316	I.	289,912	8 5
Net....	1,163,227	1,044,515	I.	118,712	11.3
Southern Pacific:					
No. Div. (Cal.) .	1,447,398	1,335,421	I.	111,977	8.3
Net....	673,805	668,344	I.	5,461	0.8
So. Div. (Cal)..	3,419,580	2,643,033	I.	776,547	29.3
Net	1,160,245	806,981	I.	353,264	43 7
Ariz. Div.....	1,352 630	1,261,328	I.	91,311	7 2
Net	541,034	556 959	D.	15,925	2.8
New Mex. Div..	576,597	552,083	I.	24 514	4.4
Net	245,132	264,052	D	18 920	7.1
Tot. So. Pac...	6,756,214	5,791,865	I.	1,004,349	17.3
Net	2,620,216	2,296,336	I.	323,880	14.1
Total (gross).....	$32 471,305	$28 473,445	I	$3,997,860	14.4
Total (net).....	14,125,095	12,319,764	I.	1,821,256	....
			D.	15,925	....
Net...	.....	.....	I.	1,805,331	14 6

Eleven Months—Jan. 1 to Nov. 30.

Canadian Pac....	$10,454,672	$9,187,702	I.	$1.266,976	13.7
Net....	3 140,411	3,423,242	D.	282,831	8.2
Ches., O & S. W..	1,798,547	1,546,450	I.	252,097	16 3
Net....	734,413	580,369	I.	154,044	26.5
Gr. B.,W. & St. P	420,967	316,003	I.	104,964	33.2
Net....	.....	.....		.....	....
Louiv. & Nash....	14,594,911	12,699,829	I.	1,895,082	14.9
Net....	5,676,378	4,983,430	I.	692 948	13.9
Mexican Central..	4 346 524	3,416.726	I.	929,798	27.2
Net....	1,882,355	1,172,702	I.	709,653	60.5
N.Y., Ont. & W..	1,430,683	1,239,830	I.	190,853	15 3
Net	257,864	189,529	I.	68 335	41.3
Ohio & Miss.....	3,782 446	3,530,913	I.	251,533	7.1
Net	1,323,827	1,069,642	I	254 165	23.6
Oregon R.& N.Co	4.816 408	4,941,810	D.	125,402	2.5
Net	2,150.751	2,122.096	I.	28,655	1.3
Pennsylvania:					
Northw'n Sys ..	16 913,364	14,118,258	I.	2,795,106	19.7
Net....	6 210,966	5,186,777	I.	1,024,189	19.7
Southw'n Sys .	12,954,754	10,836,385	I.	2,118,369	19 5
Net	3,419,801	2,548.065	I.	871.736	30 2
Phila. & Erie.....	3,708,294	3,407.310	I.	300,984	8.8
Net....	1.492,877	1,374,066	I.	118,811	8.6
Shenandoah Val.	831,640	686.339	I.	145.301	21.2
Net	130.309	112.759	I.	17,550	15.5
Tol. & Ohio C	974,946	744,927	I.	230,019	30.8
Net.....	327,983	223.041	I.	104,942	47.0
Total (gross).....	$75,258,895	$65.261,013	I.	$9,997,882	15.3
Total (net)...	26,747,935	22,985,718	I.	3,045,048	....
			D.	282,831	....
Net.....	.....	.....	I.	3,762 217	16.3

Early reports of monthly earnings are usually estimated in part, and are subject to correction by later statements.

Cotton.

The cotton movement for the week ending Jan. 5 is reported as below, in bales:

Interior markets:	1888.	1887.	Inc. or dec.		P. c.
Receipts.....	62,108	70,263	D.	8,155	11.5
Shipments.....	94 187	90.576	I	3,611	3 9
Stock.....	461,804	423,252	I.	38,552	9.1
Seaports:					
Receipts.....	150,308	159,044	I.	264	.1
Exports.....	138,573	195,891	D.	57,318	29.2
Stock....	1,043,776	1,058,027	D.	14,251	1.3

Coal.

The coal tonnages for the week ending Jan. 7 are reported as follows:

	1888.	1887.	Inc	P. c.
Anthracite	539,098	511 912	I. 27,186	5.3
Bituminous....	336,639	274,609	I. 62,030	22.5

The Cumberland coal trade for the week ending Dec. 31 amounted to 57,823 tons, for the year to that date 3,327,530 tons, and for the week ending Jan. 7, 62,049 tons.

Dressed Beef Shippers' Complaint.

The dressed beef dealers of Chicago have presented to the Inter-state Commerce Commission five petitions concerning exorbitant rates on dressed beef in refrigerator cars to Eastern points. Various firms make claims for overcharges aggregating $950,000. The petitions set forth at length the details of the methods used in loading, carrying, unloading and charging for the fresh meat traffic. Comparisons of rates are set forth showing the present tariff, the amounts actually paid before the present rates were established, and the rates for salt and smoked meats and provisions in ordinary cars. The claim is made that fresh meats cost no more to transport than the last named class of provisions, and that, therefore, the higher rate (65, as against 30 cents per 100 lbs.) is exorbitant. It is claimed that 75 per cent. of the package provisions and bulk meats shipped from Chicago are carried in refrigerator cars.

George R. Blanchard, Chairman of the Central Traffic Association, has prepared an elaborate reply to this complaint. He sets forth that dressed beef rates must be maintained at a proper ratio to live stock rates in order to insure fairness to both these interests. Mr. Blanchard quotes the full text of the award of Judge Cooley when the question was up for arbitration in 1884, and also calls attention to the fact that this question has been arbitrated at one other time. He also lays stress on the fact that lake vessels compete with the roads for package provisions, but not for dressed beef. Mr. Blanchard gives elaborate tables, showing the earnings on all classes of freight during 1886, with rates per mile, proportion of dressed beef to the total tonnage, and amount earned by each road on the traffic. He declares that the cost of handling dressed beef traffic is such that the net revenue is less than could be derived from grain or package provisions. Trains have to run at high speed, and require expert trainmen.

Trunk Line Differential Rates.

The trunk lines have agreed on a new freight tariff, to go into effect on Jan. 9, according to which the Pennsylvania and the New York Central charge higher rates than those of the other lines. The tariffs of the two roads named are on the basis of the following rates between New York and Chicago:

75 65 50 38½ 33 27½

In this schedule it will be remembered that the 4th, 5th and 6th classes have lately been advanced 10 per cent. The Erie West Shore, Lackawanna and B & O. charge as follows:

70 61 47 36½ 32 26½

The differentials allowed the Chesapeake & Ohio, New York, Ontario & Western and the Central Vermont route via New London are to be the subject of further consideration.

Traffic Notes.

Chicago dispatches state that the Hoosac Tunnel line is taking export freight from Chicago at about 2 cents per 100 less than tariff rates.

Chairman Midgeley has given notice that the grain rate from Southwestern Missouri River points to Chicago would be reduced 25 per cent., or to 15 cents. per 100 lbs This action is said to be forced by the reduction recently made by the St. Louis & San Francisco on grain from Kansas points to St. Louis.

The Chicago, Rock Island & Pacific is taking live stock in Burton stock cars at the regular tariff rates for stock in common cars. It is said that the Chicago, Burlington & Quincy insists on maintaining a difference in the rates for stock in the two kinds of cars, and threatens to reduce its rate on common car shipments to a figure that will maintain them at 20 per cent. below the rates charged in Burton cars on any competing road.

The Atchison, Topeka & Santa Fe and the Missouri Pacific have issued new local freight tariffs, which are announced by the Railroad Commissioners of Kansas as being considerably lower than the rates fixed by the official tariff of that Board. Reductions vary from 10 to 25 per cent. In distance rates the figures for 100 miles are: First-class, reduced from 55 cents to 50; fourth-class, 35 to 29; lumber, 16 to 13; soft coal, 8 to 7½; wheat, 17 to 15½. Demurrage charges are reduced from $3 to $1 per car for the first five days.

The Union Pacific has had a temporary injunction issued by the United States Court, restraining the Nebraska State Board of Transportation from interfering with its tariffs on the ground that the road is subject only to the jurisdiction of the United States Congress and courts.

It is said that the Northern Pacific has extended its track to a point exactly on the boundary line between the United States and Manitoba, and will put in a side track parallel with the boundary and close to it, so that grain cars standing in the United States can be loaded from wagons standing in Canada. This is for the purpose of shipping wheat in bond to eastern Canadian points, which has heretofore been impracticable by reason of alleged arbitrary restrictions of the customs officer at Emerson, Man.

Chairman Abbott, of the Western States Passenger Association, reports that all the lines in the association have, in response to a circular, advised him that none of their agents have violated any of the provisions of the agreements concerning paying receiving and dividing ticket commissions.

The meeting of the Western States Passenger Association in Chicago, Jan. 11, decided nothing of importance, except that the Association should be continued, notwithstanding the recent withdrawal of the Chicago & Alton, Minnesota & Northwestern and four other roads. The limit of notice to be given by roads wishing to withdraw was fixed at 51 days.

The New York, Ontario & Western has joined the Trunk Line Association.

The Central of New Jersey is said to be taking considerable freight for the West, turning it over to the Delaware, Lackawanna & Western.

Earnings of English Railroads.

English railroad traffic returns for the last six months of 1887 are now nearly complete, and so far show a decrease of ½ per cent. in passenger receipts, and an increase of 1½ per cent. in freight receipts, as compared with the corresponding period in 1886. Irish railroads show a decrease of about 4 per cent. in receipts, the decrease being principally in freight. The increase in mileage is only 136 miles for the United Kingdom, or about ⅝ per cent.

ANNUAL REPORTS.

Wrightsville & Tennille.

This company owns a line from Tennille, Ga., to Wrightsville, 16.5 miles. The report is for the year ending Nov. 30.

The general balance sheet, condensed, is as follows:

Assets:

Cost of road and equipment	$135,879
Real estate	5,290
Bills and accounts	9,967
Miscellaneous	7,550
	$158,686

Liabilities:

Capital stock	$119,289
Profit and loss	22,765
Bills payable	16,606
Due other lines	16
	$158,686

The earnings and expenses for the year were as follows:

Freight	$40,998
Passenger	15,696
Miscellaneous	8,661
Total	$65,355
Expenses	48,464
Net earnings	$16 891
Gross earn. per mile	1,866
Net " " "	481
P. c. exps.	74.1

Two miles of new 50-lb. steel rails have been purchased at a cost of about $6,500. These rails will be put down on the first section of the road, which is the worst, and the better part of those taken up will be used to repair the remainder of the line.

Further purchases of rails will be required next year for the same purpose; and still further reduction of the grades will prove greater economy in operating the road than anything that can possibly be done, and should the road do as well as it has done in the past year, there will be ample funds for this purpose and good dividends also.

Fitchburg.

The report is for the year ending Sept. 30, 1887. This company operates a line from Boston to Greenfield, 106 miles, 56 miles of which is leased; Greenfield to Troy, 86.5 miles, and Johnsonville to Rotterdam Junction, 35.5 miles; a total of 228 miles of main line. The company also operates 116.9 miles of branches, 7.8 miles of which are leased. This gives a total mileage of 344.9 miles, of which 63.8 miles are leased; 175.7 miles are double track. In 1886 the mileage was 229.3 miles, of which 58.8 were leased.

The following comparisons for the two years are complicated by the large additions made to the property at various periods

The earnings and expenses for the last two fiscal years were as follows:

	1887.	1886.	Inc. or Dec.		P. c.
Freight	$2,642,397	$2,078,446	I	$563 951	27.1
Passenger.....	1,402,689	1,072,289	I.	330,400	30.8
Express.....	103,370	81,144	I.	22.226	27.4
Mails.....	35,713	30,5.8	I.	5,185	17.0
Miscellaneous.....	385,153	137,135	I.	248,018	180.9
Total	$4,569,322	$3,399,542	I.	$1,169,780	34.4
Expenses..... ...	3,287,801	2,408,965	I.	878,836	36.5
Net earnings.....	$1,281,521	$990,577	I.	$290,944	29.3
Gross earn per mile	13,844	14,845	D.	1,001	6.7
Net " "	3,886	4,325	D.	440	1.0
P. c. of exps.....	75.2	70.8	I.	4.4	....

Expenses do not include taxes.

The expenses were divided as follows:

	1887.	1886.	Increase.
Office and transportation ..	$342,692	$235 143	I. $107,488
Passenger transportation....	282 187	219,805	I. 62,382
Freight transportation.....	795,453	580 149	I. 215,304
Motive power.....	926,951	731,489	I 195,462
Maintenance of cars.....	307,966	246.132	I. 61,834
Maintenance of way and buildings.....	632,612	396,247	I. 236,365
Total operating exps ...	$3 287,801	$2,408,965	I. $878,836
Taxes.....	194,853	150,700	I. 44,152
Total...	$3,482,654	$2,559,635	I. $922 989

The traffic statistics are as below:

	1887.	1886.	Inc. or Dec.
Passenger train mileage..	1,600.412	1,280.868	I. 319 544
Freight " " ..	1,414,241	1,159,645	I. 254,596
Passengers carried	5,026,045	4,130 295	I. 895,650
Pass. carried one mile....	55 795,642	45,862.118	I. 10,133,524
Tons freight carried.....	2 919,639	2.509,131	I. 410,498
" " " one mile.	238,913,600	195,113,082	I 43,800,518
Av passenger journey....	14.78	14.78	D. .05
" rate per mile	1.89	1.75	I. .14
" haul of freight	81.83	77.76	I. 4.07
" rate per mile..... .	1.53	1.07	I. .08

In 1879 there were 1,313,289 tons of freight carried, and in 1887 there were 2,919,629 tons. There were 92,832,640 tons of freight carried one mile in 1879, and in 1887 there were 238,913,600 tons. The average rate per ton per mile of freight was 1.30 cents; in 1880 it was 1.36 cents; in 1885 it was 1.06 cents, and in 1887 it was 1.13 cents.

The general balance sheet, condensed, was as follows:

Assets.

Construction and equipment	$34,955,070
Investments	2,169,384
Materials and supplies	625,059
Due from other lines	765,115
Due from agents	419,398
Cash	91,327
Balance	461,702
	$39,487,035

Liabilities.

Capital stock:		
Preferred	$12,437,800	
Common	7,000,000	
		$19,437,800
Liability account, Troy & Boston (stock)..		1,333,300
Funded debt		$14,540 600
Liability account, Troy & Boston (bonds)..		1.750,000
Vouchers and accounts		993 771
Dividends and interest unpaid		263 590
Notes payable		380,300
Accrued interest, taxes and rents not due..		497,059
Profit and loss surplus		281,675
		$39,478,035

The profit and loss account was as follows:

Net earnings as above		$1,281,521
Balance, Sept. 30, 1886		410,333
		$1,691,854
Taxes	$194,854	
Interest on funded debt	423.228	
Rent of roads	266,011	
Dividends (7 per cent.)	525,086	
Account charged off	1,000	
Balance, Sept. 30, 1887	281,675	
		1,691,854

By the consolidation with the Troy & Boston, the purchase of the Boston, Hoosac Tunnel & Western, and consolidation with the Troy & Greenfield and the Hoosac Tunnel the company has a line from Boston to the Hudson River and the trunk lines of the West. The distance from Troy to Boston is now 15 miles shorter than any other route; to Albany it is 3 miles shorter and by means of the West Shore connections it is about 20 miles shorter to Buffalo and points west.

The double track of the Vermont & Massachusetts division was opened early in the year to Greenfield. The double track on the main line (by combination of the old tracks of the Troy & Boston, and the Boston, Hoosac Tunnel & Western) now extends from Boston to Johnsonville, N. Y., 175 miles; in addition to which there are about 6½ miles of double track between Johnsonville and Rotterdam, leaving of single track in main line 16 miles Johnsonville to Troy, and 30¼ miles to Rotterdam Junction.

The articles of consolidation with various companies and the contract for the purchase of the Boston, Hoosac Tunnel & Western are appended to the report.